



Natural Resources Conservation Service

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**FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT**  
**For the**  
**LONG BEACH WATERSHED**  
(Hydrologic Unit Number 03170009-0603)

A supplement to the original environmental impact statement for providing updated impacts for the channel modification of Canal 1; includes supplemental watershed agreement No. 2.

Harrison County, Mississippi

September 2015



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# **SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT**

## **For Channel Modifications to Canal 1 Long Beach Watershed Harrison County, Mississippi**

(Hydrologic Unit Number 03170009-0603)

A supplement to the original environmental impact statement for providing updated impacts for the channel modifications of Canal 1; includes supplemental watershed agreement No. 2.

### **Prepared by:**

U.S. Department of Agriculture, Natural Resources Conservation Service  
In Cooperation with the U.S. Army Corps of Engineers Mobile District and  
The Sponsoring Local Organizations: Long Beach Water Management District, City of Long Beach and the  
Harrison County Soil and Water Conservation District

### **AUTHORITY**

The original work plan was prepared under the authority of the Watershed Protection and Flood Prevention Act (Public Law 83-566), as amended (16 U.S.C. Parts 1001-1008, 1010 and 1012).

### **ABSTRACT**

Canal 1 is a manmade canal constructed in or about 1918 originating in Harrison County near the western edge of Gulfport. The Long Beach Watershed plan and Environmental Impact Statement was developed in 1989 to modify Canal 1 in order to reduce flooding to urban areas along the canal. Local project sponsors have chosen to update the Environmental Impact Statement in order to identify the impacts of channel modification. The purpose of the channel modifications is to reduce flooding to the residences and business along the canal. The modification consists of 3.8 miles of widening, side-sloping and grading of the earth-lined channel, and 0.2 miles of rock riprap lined channel. The project installation cost is estimated to be \$3,233,700. Minimal environmental impacts have been identified on wildlife habitats and wetlands associated with the remaining work for Canal No. 1, the subject of this Supplemental Environmental Impact Statement. Appropriate measures will be implemented to mitigate adverse effects.

### **NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE**

This document fulfills the requirements of the National Environmental Policy Act and is to be considered authorization for funding under Public Law 83-566.

### **COMMENTS AND INQUIRIES:**

Comments and inquiries must be received by April 1, 2015. Submit comments and inquiries to: Kurt Readus, State Conservationist USDA, Natural Resources Conservation Service, 100 W. Capitol Street, Suite 1321 Jackson, Mississippi 39269, (601) 965-5205

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Office of the Assistant Secretary for Civil Rights

1400 Independence Avenue, SW.

Washington, DC 20250-9410

Or call toll free at (866) 632-9992 (voice) to obtain additional information, the appropriate office or to request documents. Individuals who are deaf, hard of hearing, or have speech disabilities may contact USDA through the Federal Relay service at (800) 877-8339 or (800) 845-6136 (in Spanish). USDA is an equal opportunity provider, employer, and lender.

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# **LONG BEACH WATERSHED**

## **Supplemental Watershed Agreement No. 2**

For Canal 1 Channel Modifications

Between the

Long Beach Water Management District  
City of Long Beach  
Harrison County Soil and Water Conservation District

State of Mississippi

And the

Natural Resources Conservation Service  
(Referred to herein as NRCS)  
United States Department of Agriculture

**Whereas**, application has heretofore been made to the Secretary of Agriculture by the sponsors for assistance in preparing a supplemental environmental impact statement for works of improvement for the Long Beach Watershed, State of Mississippi, under the authority of the Watershed Protection and Flood Prevention Act, as amended ( 16 U. S. C. Sections 1001 to 1008, 1010, and 1012); and

**Whereas**, the responsibility for administration of the Watershed Protection and Flood Prevention Act, has been assigned by the Secretary of Agriculture to NRCS; and

**Whereas**, there has been developed through the cooperative efforts of the sponsors and NRCS an Supplemental Environmental Impact Statement for works of improvement for the Long Beach Watershed, State of Mississippi, hereinafter referred to as the SEIS, which is annexed to and made a part of this agreement;

**Now**, therefore, in view of the foregoing considerations, the Secretary of Agriculture, through NRCS and the sponsors hereby agree on this SEIS and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provided for in this supplemental watershed agreement and including the following:

- 1. Term.** The term of this agreement is for the expected life of the project (100 years) and does not commit the NRCS to assistance of any kind beyond that point unless agreed to by all parties.
- 2. Costs.** The costs shown in this agreement are preliminary estimates. Final costs to be borne by the parties hereto will be the actual costs incurred in the installation of works of improvement.
- 3. Real Property.** The sponsors will acquire all land rights, easements, or right-of-ways as will be needed in connection with the works of improvement. The amount and percentages of the real

property acquisition cost to be borne by the Sponsors and NRCS are as shown in the cost-share table in item 5 hereof.

**4. Uniform Relocation Assistance and Real Property Acquisition Policies Act.** The sponsors hereby agree that they will comply with all of the policies and procedures of the Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 U.S.C. 4601 et.seq. as further implemented through regulations in 49 C.F.R. Part 24 and 7 C.F.R. Part 21) when acquiring real property interests for this federally assisted project. If the sponsors are legally unable to comply with the real property acquisition requirements of the Act, they agree that, before any federal financial assistance is furnished; they will provide a statement to that effect, supported by an opinion of the chief legal officer of the state containing a full discussion of the facts and law involved. This statement may be accepted as constituting compliance.

**5. Cost-share for Channel Modification.** The percentages of total canal project costs to be paid by the sponsors and by NRCS are as follows:

Canal 1

Works of Improvement	NRCS	Sponsors	Total
<b>Cost Sharable Items</b>			
Channel Modifications (Construction Cost)	\$1,895,700	\$0	\$1,895,700
Relocation, Replacement in-kind	\$0	\$0	\$0
Relocation, Required Decent, Safe, Sanitary	\$0	\$0	\$0
Sponsors Planning Costs	NA	\$0	\$0
Sponsors Engineering Costs	NA	\$0	\$0
Sponsors Project Administration a/	NA	\$6,000	\$6,000
Land Rights Acquisition Cost b/	NA	\$930,400	\$930,400
<b>Subtotal: Cost-Share Costs</b>	<b>\$1,895,700</b>	<b>\$936,400</b>	<b>\$2,832,100</b>
<b>Cost-Share Percentages</b>	<b>65%</b>	<b>35%</b>	<b>100%</b>
<b>Non Cost-Sharable Items c/</b>			
NRCS Engineering & Project Administration a/	\$401,600	NA	\$401,600
Natural Resources Rights	NA	\$0	\$0
Federal, State and Local Permits	NA	\$0	\$0
Relocation, Beyond Required decent, safe, sanitary	NA	\$0	\$0
<b>Subtotal: Non Cost-Share Costs</b>	<b>\$401,600</b>	<b>\$0</b>	<b>\$401,600</b>

a/The sponsors and NRCS will each bear the costs of project administration that each incurs.

b/The sponsors will acquire with other than Watershed Protection and Flood Prevention Act Funds, such real property as will be needed in connection with the works of improvement. The value of real property is eligible as in-kind contributions toward the sponsors' share of the works of improvement costs. In no case will the amount of an in-kind contribution exceed the sponsors' share of the cost for works of improvement. The maximum cost eligible for in-kind credit is the same as that for cost sharing.

c/ If actual Non Cost-Sharable item expenditures vary from these figures, the responsible party will bear the change.

**6. Floodplain Management.** Before construction of any project for flood prevention, the sponsors shall agree to participate in and comply with applicable Federal floodplain management and flood insurance programs.

**7. Water and mineral rights.** The sponsors will acquire or provide assurance that landowners or resource users have acquired such water, mineral, or other natural resources rights pursuant to State law as may be needed in the installation and operation of the works of improvement. Any costs incurred shall be borne by the sponsor and these costs are not eligible as part of the sponsors cost-share.

**8. Permits.** The sponsors will obtain and bear the cost for all necessary Federal, State, and local permits required by law, ordinance, or regulation for installation of the works of improvement. These costs are not eligible as part of the sponsors cost-share.

**9. NRCS assistance.** This agreement is not a fund-obligating document. Financial and other assistance to be furnished by NRCS in carrying out the Rehabilitation Plan is contingent upon the fulfillment of applicable laws and regulations and the availability of appropriations for this purpose.

**10. Additional agreements.** A separate agreement will be entered into between NRCS and the sponsors before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.

**11. Amendments.** This SEIS may be amended or revised only by mutual agreement of the parties hereto, except that NRCS may de-authorize or terminate funding at any time it determines that the sponsors have failed to comply with the conditions of this agreement or when the program funding or authority expires. In this case, NRCS shall promptly notify the sponsors in writing of the determination and the reasons for the de-authorization of project funding, together with the effective date. Payments made to the sponsors or recoveries by NRCS shall be in accord with the legal rights and liabilities of the parties when project funding has been de-authorized. An amendment to incorporate changes affecting a specific measure may be made by mutual agreement between NRCS and the sponsors having specific responsibilities for the measure involved.

**12. Prohibitions.** No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this plan, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

**13. Operation and Maintenance (O&M).** The sponsors will be responsible for the operation, maintenance, and any needed replacement of the works of improvement by actually performing the work or arranging for such work, in accordance with the Operation and Maintenance Agreement. An O&M agreement will be entered into before Federal funds are obligated and will continue for the project life (100 years). Although the sponsor's responsibility to the Federal Government for O&M ends when the O&M agreement expires upon completion of the evaluated life of measures covered by the agreement, the sponsors acknowledge that continued liabilities and responsibilities associated with works of improvement may exist beyond the evaluated life.

**14. Memorandum of Understanding.** A Memorandum of Understanding (MOU) shall be prepared between NRCS and the project sponsors that identifies and establishes a maximum value of the non-federal in-kind contribution. All project sponsors providing in-kind services and/or land rights acquisition for the rehabilitation project shall sign the MOU. Only costs accrued for activities included in the MOU shall be considered as part of the non-federal in-kind contribution. Determination of the final amount to be credited shall be at the sole discretion of NRCS.

**15. Nondiscrimination provisions.** The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers. If you believe you experienced discrimination when obtaining services from USDA, participating in a USDA program, or participating in a program that receives financial assistance from USDA, you may file a complaint with USDA. Information about how to file a discrimination complaint is available from the Office of the Assistant Secretary for Civil Rights. USDA prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex (including gender identity and expression), marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.)

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**16. Certification Regarding Drug-Free Workplace Requirements.** (7CFR Part 3021). By signing this watershed agreement, the sponsors are providing the certification set out below. If it is later determined that the sponsors knowingly rendered a false certification, or otherwise violated the requirements of the Drug-Free Workplace Act, the NRCS, in addition to any other remedies available to the Federal Government, may take action authorized under the Drug-Free Workplace Act.

*Controlled substance* means a controlled substance in Schedules I through V of the Controlled Substances Act (21 U.S.C. Section 812) and as further defined by regulation (21 CFR Sections 1308.11 through 1308.15);

*Conviction* means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes;

*Criminal drug statute* means a Federal or non-Federal criminal statute involving the manufacturing, distribution, dispensing, use, or possession of any controlled substance;

*Employee* means the employee of a grantee directly engaged in the performance of work under a grant, including: (i) all direct charge employees; (ii) all indirect charge employees unless their impact or involvement is insignificant to the performance of the grant; and (iii) temporary



personnel and consultants who are directly engaged in the performance of work under the grant and who are on the grantee's payroll. This definition does not include workers not on the payroll of the grantee (e.g., volunteers, even if used to meet a matching requirement; consultants or independent contractors not on the grantees' payroll; or employees of sub-recipients or subcontractors in covered workplaces).

**Certification:**

A. The sponsors certify that they will or will continue to provide a drug-free workplace by:

(1) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition.

(2) Establishing an ongoing drug-free awareness program to inform employees about:

(a) The danger of drug abuse in the workplace;

(b) The grantee's policy of maintaining a drug-free workplace;

(c) Any available drug counseling, rehabilitation, and employee assistance programs; and

(d) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.

(3) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1).

(4) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee will:

(a) Abide by the terms of the statement; and

(b) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction.

(5) Notifying the NRCS in writing, within ten calendar days after receiving notice under paragraph (4) (b) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant.

(6) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (4) (b), with respect to any employee who is so convicted:

(a) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or

(b) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.

(7) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (1), (2), (3), (4), (5), and (6).

B. The sponsors may provide a list of the site(s) for the performance or work done in connection with a specific project or other agreement.

C. Agencies shall keep the original of all disclosure reports in the official files of the agency.

**17. Certification Regarding Lobbying (7 CFR Part 3018).**

(applicable if this agreement exceeds \$100,000).

A. The sponsors certify to the best of their knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the sponsors, to any person for influencing or attempting to influence an officer or employee of an agency, Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The sponsors shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

B. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

**18. Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions (7 CFR Part 3017).**

A. The sponsors certify to the best of their knowledge and belief, that they and their principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or Local) transaction or contract under a public transaction; violation of Federal or State

antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or Local) with commission of any of the offenses enumerated in paragraph (A)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or Local) terminated for cause of default.

B. Where the primary sponsors are unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this agreement.

## **19. Clean Air and Water Certification.**

(Applicable if this agreement exceeds \$100,000, or a facility to be used has been subject of a conviction under the Clear Air Act (42 U.S.C. Section 7413(c)) or the Federal Water Pollution Control Act (33 U.S.C. Section 1319(c)) and is listed by EPA, or is not otherwise exempt)

A. The project sponsoring organizations signatory to this agreement certify as follows:

- (1) Any facility to be utilized in the performance of this proposed agreement is (\_\_\_\_), is not (x) listed on the Environmental Protection Agency List of Violating Facilities.
- (2) To promptly notify the NRCS-State administrative officer prior to the signing of this agreement by NRCS, of the receipt of any communication from the Director, Office of Federal Activities, U.S. Environmental Protection Agency, indicating that any facility which is proposed for use under this agreement is under consideration to be listed on the Environmental Protection Agency List of Violating Facilities.
- (3) To include substantially this certification, including this subparagraph, in every nonexempt sub-agreement.

B. The project sponsoring organization(s) signatory to this agreement agrees as follows:

- (1) To comply with all the requirements of section 114 of the Clean Air Act as amended (42 U.S.C. Section 7414) and section 308 of the Federal Water Pollution Control Act (33 U.S.C. Section 1318), respectively, relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Air Act and the Water Act, issued there under before the signing of this agreement by NRCS.
- (2) That no portion of the work required by this agreement will be performed in facilities listed on the EPA List of Violating Facilities on the date when this agreement was signed by NRCS unless and until the EPA eliminates the name of such facility or facilities from such listing.
- (3) To use their best efforts to comply with clean air standards and clean water standards at the facilities in which the agreement is being performed.

- (4) To insert the substance of the provisions of this clause in any nonexempt sub agreement.

C. The terms used in this clause have the following meanings:

- (1) The term “Air Act” means the Clean Air Act, as amended (42 U.S.C. Section 7401 et seq.).
- (2) The term “Water Act” means Federal Water Pollution Control Act, as amended (33 U.S.C. Section 1251 et seq.).
- (3) The term “clean air standards” means any enforceable rules, regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted pursuant to the Air Act or Executive Order 11738, an applicable implementation plan as described in section 110 of the Air Act (42 U.S.C. Section 7414) or an approved implementation procedure under section 112 of the Air Act (42 U.S.C. Section 7412).
- (4) The term “clean water standards” means any enforceable limitation, control condition, prohibition, standards, or other requirement which is promulgated pursuant to the Water Act or contained in a permit issued to a discharger by the Environmental Protection Agency or by a State under an approved program, as authorized by section 402 of the Water Act (33 U.S.C. Section 1342), or by a local government to assure compliance with pretreatment regulations as required by section 307 of the Water Act (33 U.S.C. Section 1317).
- (5) The term “facility” means any building, plant, installation, structure, mine, vessel, or other floating craft, location or site of operations, owned, leased, or supervised by a sponsor, to be utilized in the performance of an agreement or sub-agreement. Where a location or site of operations contains or includes more than one building, plant, installation, or structure, the entire location shall be deemed to be a facility except where the Director, Office of Federal Activities, Environmental Protection Agency, determines that independent facilities are collocated in one geographical area.

## **20. Assurances and Compliance**

As a condition of the grant of cooperative agreement, the sponsor assures and certifies that it is in compliance with and will comply in the course of the agreement with all applicable laws, regulations, Executive orders and other generally applicable requirements, including those set out below which are hereby incorporated in this agreement by reference, and such other statutory provisions as a specifically set forth herein.

State, Local, and Indian Tribal Governments: OMB Circular Nos. A-87, A-102, A-129, and A-133; and 7 C.F.R. Parts 3015, 3016, 3017, 3018, 3021, 3052.

Nonprofit Organizations, Hospitals, Institutions of Higher Learning: OMB Circular Nos. A-110, A-122, A-129, and A-133; and 7 C.F.R. Parts 3015, 3017, 3018, 3019, 3021, and 3052.



## **21. Examination of Records.**

The sponsors shall give the NRCS or the Comptroller General, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to this agreement, and retain all records related to this agreement for a period of three years after completion of the terms of this agreement in accordance with the applicable OMB Circular.

## 22. Signatures

### Long Beach Water Management District

P. O. Box 748

Long Beach, MS 39560

Address

Zip Code

BY

Brett M. Mott

Title

Chairman

Date

6-12-15

The signing of this supplemental watershed agreement was authorized by a resolution of the governing body of the Long Beach Water Management District adopted at a meeting held on

June 12, 2015 (Date).

Stacey Scholtz PO Drawer W, Gulfport, MS 39502

Secretary

Address

Zip Code

### Harrison County Soil and Water

#### Conservation District

12238 Ashley Drive

Gulfport, MS 39503

Address

Zip Code

BY

Phyllis Kay

Title

Vice Chair

Date

7-2-15

The signing of this supplemental watershed agreement was authorized by a resolution of the governing body of the Harrison County Soil and Water Conservation District adopted at a meeting held on

7-2-15 (Date).

Beth Daquila

Secretary

Address

Zip Code

### City of Long Beach

201 Jeff Davis Avenue

Long Beach, MS 39560

Address

Zip Code

BY

William Salter

Title

MAYOR

Date

6/16/2015

The signing of this supplemental watershed agreement was authorized by a resolution of the governing body of the City of Long Beach adopted at a meeting held on

6/16/2015 (Date).

William Salter 201 Jeff Davis Ave LB MS 39560

Secretary

Address

Zip Code

### Natural Resources Conservation Service

#### United States Department of Agriculture

100 W. Capitol Street, Suite 1321 Federal Building

Jackson, Mississippi

39269

Address

Zip Code

BY

K. Readus

Kurt Readus

Title: State Conservationist

Date

9/3/2015

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## Summary of the Supplemental Environmental Impact Statement for the Long Beach Watershed

Project Name: Long Beach Supplemental Environmental Impact Statement for the channel modification of Canal 1

Authorization: Public Law 83-566 (16 U.S.C. Parts 1001 – 1008, 1010 and 1012)

County: Harrison

State: Mississippi

Mississippi Congressional District: 4

Sponsors: Long Beach Water Management District, Harrison County Soil and Water Conservation District, City of Long Beach

Hydrologic Unit Number: 03170009-0603

Latitude and Longitude: Upper end of Canal 1: Lat. 30.3836, Long -89.1366

Description of Preferred Alternative: Improve 3.8 miles of earth-lined channel and install 0.2 miles of rock riprap lined channel

<u>Resource Information:</u>	<u>Watershed</u>
Drainage Area (acres)	10,857
Land Use (acres)	
Grass Land	688
Forest Land	4,206
Urban and Built-Up	4,825
Idle Land	536
Marsh Land	546
Other	56

<u>Land Ownership:</u>	
% Private	89.4%
% Federal	0%
% State/Local	10.6%

<u>Wetlands (lacustrine acres) Total:</u>	3,587.1
Estuarine and Marine	387.6
Palustrine Emergent	90.8
Palustrine Forested or Shrub	3,033.7
Lacustrine	75.0

<u>Floodplains:</u>	
Floodplains Total	1,861.4
Grassland	34.4
Forestland	1,043.5
Urban and Built-Up	695.8
Idle Land	77.6
Other	10.1

**Project Beneficiary Profile**

	Harrison County <sup>(1)</sup>	Mississippi <sup>(1)</sup>	Nation <sup>(1)</sup>
Population	194,029	2,986,450	313,873,685
% White Alone	70.6	59.9	77.9
% Black or African American Alone	23.4	37.4	13.1
% American Indian & Alaska Native Alone	0.6	0.6	1.2
% Asian Alone	2.9	0.9	5.1
% Native Hawaiian & Other Pacific Islander Alone	0.1	0.1	0.2
% Two or More Races	2.4	1.1	2.4
% Hispanic or Latino	5.4	2.9	16.9
% White Alone, not Hispanic or Latino	66.1	57.6	63.0
Median per capita income	\$23,378	\$20,670	\$28,051
Median household income	\$43,593	\$38,882	\$53,046
Median value owner-occupied housing units	\$143,900	\$100,200	\$181,400
Persons living below the poverty level	18.2%	22.3%	14.9%
1) 2012 Data from <a href="http://quickfacts.census.gov/qfd/states/28000.html">http://quickfacts.census.gov/qfd/states/28000.html</a> , State and County Quick Facts			

**Threatened and Endangered Species:** There are no threatened or endangered species known to be present in the Canal No. 1 study area. A letter was received May 2009 from USFWS stating: “no impacts anticipated to any federal listed species.”

**Cultural Resources:** According to the Cultural Resources Survey completed by Earth Search in December of 2008, there are no sites or structures of archaeological or historical significance known to be present in the Canal No. 1 study area. The Mississippi Department of Archives and History concurred with the survey in a letter dated March 10, 2009.

**Climate:** Average Annual Precipitation: 63.41 inches  
Average Annual Temperature: 77.1 degrees

**Topography:** The watershed lies in the Gulf Coast Flatwoods Physiographic area, a flat strip of land which parallels the coastline and terminates in a man-made seawall and white-sand beach. Elevations range between 5 and 30 feet above mean seal level.

**Relevant Resource Concerns from Scoping:** Floodwater, Streams, Lakes and Wetlands, Clean Water Act, Floodplain Management, Wetlands, Air Quality, Clean Air Act, Riparian Areas, Land Use and Flora, Fish and Wildlife Habitat, Endangered and Threatened Species, Flood Damages, Sponsors Cost, NED Cost, Historic Properties, Local and Regional Economy, Public Health and Safety, Transportation

**Problem Identification:** Homes and businesses, as well as roads and bridges, utilities and other public facilities within the watershed, are vulnerable to flooding due to the inadequacy of existing drainage provided by Canal No. 1. The total value of at-risk property in the Canal No. 1 floodplain is estimated to be \$11,750,300. The average annual cost of damage to structures and their contents from flooding in the Canal No. 1 floodplain is \$1,069,300.

**Alternative Plans Considered:**

1. No Action (Future Without Federal Project): Sponsors would leave the Canal 1 unimproved. With this alternative there would not be reduction in flood damage along the canal.
2. Alternative 2 (Channel improvements): Improve 3.8 miles of earth-lined channel and install 0.2 miles of rock riprap lined channel. This alternative would provide flood damage reduction benefits to the homes along Canal 1.

Purpose and Need for the Remaining Work: To reduce flooding to residences and businesses located within the floodplain of Canal No. 1. The purpose of *the remaining work which is the focus of this Supplemental EIS* is to implement the additional improvements necessary to reduce flood damages to 121 structures located along Canal No. 1.

Remaining Project Measures to be Completed: Proposed improvements to the 4.7 miles of Canal 1 between the Naval Construction Battalion Center (NCBC) and Espy Avenue include 3.8 miles of widening, side-sloping and grading of the earth-lined channel, about two-tenths of one mile of rock riprap-lined channel construction and seven-tenths of one mile of selective snagging. The earth-lined channel sections will be constructed with 3:1 side slopes and a bottom width of 30-40 feet. The existing bottom width is 18-40 feet. These improvements will significantly enhance the capacity of Canal No. 1 and reduce damages associated with flooding in the Canal No. 1 floodplain.

<b>Project Costs:</b>	<b>Public Law 83-566 funds</b>	<b>Sponsor's funds</b>	<b>Total Project Costs</b>
Construction	\$1,895,700	\$0	\$1,895,700
Engineering	\$360,200	\$0	\$360,200
Project Administration	\$41,400	\$6,000	\$47,400
Land rights	\$0	\$930,400	\$930,400
<b>Total for Sites 15 and 16</b>	<b>\$2,297,300</b>	<b>\$936,400</b>	<b>\$3,233,700</b>

Project Benefits: Reduces flooding to 121 homes located along Canal 1. Modifications to Canal 1 will provide \$492,200 of average annual flood damage reduction benefits.

Net Beneficial effects:

Monetary: Provides net benefits of \$369,300.

Number of Direct Beneficiaries: Offsite 310

Benefit to Cost Ratio: 3.1:1.0

Period of Analysis: 104 Years

Project Life: 100 Years

<u>Funding Schedule:</u>	<u>Year 2015</u>	<u>Year 2016</u>	<u>Year 2017</u>	<u>Year 2018</u>
Federal Funds	\$0	\$360,200	\$947,800	\$989,300
Non-Federal Funds	\$465,200	\$465,200	\$6,000	\$0

Mitigation: Minimization measures include sediment control features such as 3:1 channel side-slopes, vegetation of disturbed areas every 500 feet of construction, sediment traps within constructed channel

segments, and small equipment usage for selective snagging activities. Compensatory measures include reforestation of 119 acres to replace the loss of pine and hardwood habitats. Mitigation for the potential loss of approximately 0.01 acres of wetland will be determined during the Section 404 permitting process.

Environmental Values changed or lost: Loss of 61 acres riparian timber. Planting of 119 acres of hardwood tree species.

Major Conclusions: Modification to Canal 1 will provide flood damage reduction benefits for 121 homes/business along the canal.

Areas of Controversy: None

Issues to be Resolved: None

Evidence of Unusual Congressional or Local Interest: None

Is this report in compliance with executive orders, public laws, and other statutes governing the formulation of water resource projects? Yes x No\_\_\_



## Purpose and Need for the Remaining Work

### Purpose

To reduce flooding to residents and businesses along Canal 1 by modifying the channel to carry a larger capacity of runoff. The remaining proposed work will reduce flood damages to 121 residences and businesses located along the canal.

### Need

To address public health and safety issues surrounding the flooding to residences and businesses located along Canal No. 1.

## Scope of the EIS

A scoping process was conducted to determine objectives and primary concerns of the project sponsors and to identify other relevant issues and environmental concerns associated with Canal No. 1. Several meetings and watershed site visits were held with project sponsors, landowners, and other agency personnel to discuss issues on, and potential impacts to, human health and safety, flooding, land use and management, wetlands, riparian habitat, and fish and wildlife habitat. Areas of potential concern were evaluated and are listed in Table A along with their relevance to the proposed action.

Table A. Summary of Scoping

ITEM / CONCERN	Relevant to the proposed action		RATIONALE
	YES	NO	
<b>SOILS</b>			
Upland Erosion		X	Upstream area is mostly urban.
Stream bank erosion		X	Stream bank is stable.
Sedimentation		X	Little sedimentation from urban areas upstream.
Prime and Unique Farmland		X	None present.
<b>WATER</b>			
Floodwater	X		Major concern.
Streams	X		Potential impacts with some alternatives.
Lakes and Wetlands	X		Potential impacts with some alternatives.
Surface Water Quality		X	Potential impacts with some alternatives.
Surface Water Quantity		X	No effects
Ground Water Quantity		X	No effects
Clean Water Act	X		Alternatives may require USACE 404 permit.

Table A. Summary of Scoping Continued

ITEM / CONCERN	Relevant to the proposed action		RATIONALE
	YES	NO	
Regional Water Mgt. Plans, Waters of the United States and Coastal Zone Management Areas		X	None present in area of project.
Floodplain Management	X		121 structures impacted by 500-year flood event
Sole Source Aquifers		X	No sole source aquifers identified in Coastal Mississippi.
Wetlands	X		Potential impacts with some alternatives
Wild and Scenic Rivers		X	None present in area of project.
<b>AIR</b>			
Air Quality	X		Possible temporary increase in PM-10 or other potential emissions with some alternatives.
Clean Air Act	X		Permits may be required if it involves emission of a regulated pollutant.
<b>PLANTS</b>			
Endangered and Threatened Species		X	None Present
Essential Fish Habitat		X	No designated areas in the area of the project.
Invasive Species		X	Low potential for any species introduction.
Natural Areas		X	No designated areas in the area of the project.
Riparian Areas	X		Potential decrease with some alternatives.
Ecological critical areas		X	None present in the area of the project.
Forest resources		X	Low potential for significant affect.
Land Use and Flora	X		Potential change with some alternatives.
Mineral Resources		X	None Present
<b>ANIMALS</b>			
Fish and Wildlife Habitat	X		Potential changes in habitat with some alternatives.
Coral Reefs		X	None Present.
Endangered and Threatened Species	X		“Not likely to adversely affect” determination concurred in by USFWS.
Invasive Species		X	No invasive species in the area of the project and no potential for introduction.
Migratory Birds/Bald and Golden Eagles	X		No impacts to migratory birds or eagles.
<b>HUMANS</b>			
Cultural Resources			No impacts
Flood Damages	X		Annual flood damages = \$1,069,300
Cost, Sponsor	X		Proposals must be within the economic capacity of the sponsors.
Cost, NED	X		Required criteria by P & G.
Historic Properties	X		No documented NRHP sites in area of project.
Environmental Justice and Civil Rights	X		The channel modifications will decrease flooding to individuals along Canal 1.
Local and Regional Economy	X		Increased protection with some alternatives.
Potable Water Supply		X	No impacts
Public Health and Safety	X		Potential damages to residences with the no action alternative.
Recreation		X	No impacts
Transportation	X		Potential damages with the no action alternative.
Employment		X	No impacts
Scenic Beauty and Parklands		X	No impacts
Scientific Resources		X	None present in area of project

## Affected Environment

### Background and Current Status

The Long Beach Watershed Plan and EIS was completed in 1989. The project was formulated for the purpose of reducing flood damages to residences and businesses by improving two canals, Canal No. 1 and Canal No. 2-3. These canals were originally constructed in 1918. Since 1918, urbanization within the drainage area of the Long Beach Watershed has steadily increased causing need for improvements. After completion of the Long Beach Watershed Plan and EIS in 1989, Canal 2-3 improvements were completed in 2012 with Canal No. 1 improvements still remaining. This Supplemental EIS will update the effects of implementing Canal No.1 in order to reduce flooding to residences and businesses along the canal.

Canal No. 1 is a man-made canal located at the upper end of Johnson Bayou and flows into the St. Louis Bay which flows in a southwesterly direction. The original Long Beach Watershed Plan and EIS proposed improvements to the 4.7 miles of Canal 1 between the Naval Construction Battalion Center (NCBC) and Espy Avenue including 3.8 miles of earth-lined channel construction, about two-tenths of one mile of rock riprap-lined channel construction and seven-tenths of one mile of selective snagging. The earth-lined channel sections are proposed to be constructed with 3:1 side slopes and a bottom width of 30-40 feet. The existing bottom width is 18-40 feet. These improvements will significantly enhance the capacity of Canal No. 1 and reduce damages associated with flooding in the Canal No. 1 floodplain.

### *Size and Location:*

Detailed information regarding the size and location may be found on pages 5-9 of the original watershed Plan-EIS. The material presented in this section is intended to update or supplement information presented in the 1989 document.

### *Climate:*

Based on the Southeast Regional Climatic Center, the Mississippi Gulfport Naval Center's climate data was updated in 2012 with average annual figures based on data from 1935 to 2012. The average annual precipitation is 63.41 inches. The wettest month is July with an average of 7.42 inches and the driest month is October with an average of 2.98 inches. The average annual temperature is 77.1 degrees Fahrenheit. January is the coldest month with an average temperature of 61.0 degrees and July and August are the hottest months with an average temperature of 90.6 degrees.

### *Geology, Topography and Soils:*

Information regarding geology, topography and soils may be found on pages 6 and 7 of the original Watershed Plan-EIS. There is no perceived need to update this information.

### *Population:*

The Long Beach Watershed is located entirely in Harrison County. According to the 2012 Census information Harrison County has a population of 194,029. The county population is 70.6% white, 23.4% black, 5.4% Hispanic and 0.6% Native American. The City of Long Beach, which contains 42 percent of the area of the watershed, had a population of 15,300 in 2012 according to the 2010 Census Estimates.

The City of Pass Christian, which contains 13 percent of the watershed, had a population of 4,920 in 2012. According to the U.S. Environmental Protection Agency's Environmental Justice Map Figure No. 2, The population along Canal No. 1 from 28<sup>th</sup> St. southwest to Klondike St. is 10-30% minority; the south side of Canal No. 1 from Klondike southwest to Beatline Rd. is 1-10% minority and the population on the south side of canal from Beatline Rd. southwest to Menge Ave. is 40-100% minority. Based on data that was collected during the inventory of houses we do not foresee an influx of population or a build out along the Canal. The area that is affected by the canal is located within a floodplain area; any construction in this area is governed by local floodplain management.

#### *Social and Economic Data:*

The largest single employer in the City of Long Beach is Triton Systems, Inc., a manufacturer of automated teller machine (ATM) equipment. Triton currently employs 185 workers according to the Harrison County Development Commission. The largest employer in the City of Pass Christian is DuPont DeLisle, a manufacturing company, which employs 850 workers. The unemployment rate for Harrison County was 8.4% in 2012 compared to the State of Mississippi at 9.0%. The unemployment rate for the county is slightly lower than the 8.9% rate from the original 1986 watershed plan.

#### *Land Use and Development*

Much of the land along Canal No. 1 has been developed for residential or other uses an inventory of parcels abutting the canal right-of-way revealed that there are 292.8 acres of residential property adjacent to the canal. This represents slightly more than one-third of the 868.4 acres contained in land parcels abutting the Canal No. 1 right-of-way. Another 357.6 acres (41.2 percent of the total) remain undeveloped. The remaining 25 percent of the acreage contained in parcels adjacent to the canal is primarily devoted to services (121.4 acres of 14.0 percent) or agriculture and forestry (82.3 acres or 9.5 percent). The balance of 14.2 acres, representing only 1.6 percent of the total, is divided among trade, transportation, utilities and industrial uses.

Development is fairly intensive south of the canal in the older sections of the City of Long Beach. Population density in this area exceeds 2,000 persons per square mile. In the newer section of the city located north of the canal, population density is closer to 1,000 persons per square mile. The most sparsely populated portion of the study area is located west of Beatline Rd. in Pass Christian and unincorporated Harrison County. Population Density in the area bounded by Pineville Rd. on the north, Second St. on the south, Espy Ave. on the west and Beatline Rd. on the east, is only about 300 persons per square mile. Much of this area is occupied by the Harrison County Development Commission's Long Beach Industrial Park. Many of the houses that were destroyed or damaged by Hurricane Katrina have not been rebuilt.

There are 121 structures consisting predominantly of residences and businesses currently impacted by flooding during the 500-year flood event, 107 structures are impacted by the 100-year flood event.

#### *Floodplain Management*

Harrison County, which includes the Long Beach Watershed, is a participating member of the National Flood Insurance Program (NFIP) administered by the Federal Emergency Management Agency (FEMA).

The NFIP was created to mitigate future flood losses nationwide through sound, community-enforced building and zoning ordinances; and to provide access to affordable flood insurance protection for property owners. To participate in the NFIP, local communities have to agree to adopt and enforce floodplain management ordinances designed to reduce future flood risks to existing and new construction. The current Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) for Harrison County (FIS # 28047CV001A) were published in 2007 and are largely based on hydrologic and hydraulic analysis completed in 1985.

### *Flood Waters*

There are 121 structures including homes and businesses located within the 500-year floodplain along Canal No. 1 and 107 of these structures are located within the 100-year floodplain along the canal. These structures receive damages from floodwaters during large storm events.

### *Flood Damages*

The 121 structures including homes and businesses that are located within the 500-year floodplain along Canal No. 1. These structures incur an estimated total of \$1,069,300 in average annual damages from flooding along Canal No 1.

### *Public Health and Safety*

Landowners living and working along Canal No. 1 are at risk during flood events, they can incur damages to houses and businesses. They may also need to use alternate routes during flooding to avoid dangerous floodwaters on roads and bridges.

### *Water Quality*

The general water quality of Canal No. 1 was noted during a field survey conducted October 13-16, 2008. Water in the channel was consistently turbid and murky brown. The flow was impeded in places by beaver dams, woody debris, or man-made ponds. The presence of anthropogenic trash and other debris in the water was noted. However, Canal No. 1 is not included in the Mississippi Department of Environmental Quality (MDEQ) "List of impaired Water Bodies" (MDEQ 2009). There are no scenic streams in the project corridor.

### *Wetlands and U.S. Jurisdictional Waters*

Preliminary wetland investigations with on-site inspections were conducted along the 4.7-mile length of Canal No. 1 within the project limits during the period from October 13-15, 2008. The field reconnaissance included a 125-foot corridor on either side of the canal. The preliminary survey identified 4.74 acres of palustrine wetlands, 2.89 acres of lacustrine wetlands, and 5.26 miles of U.S. jurisdictional waters within the project area. A second wetlands survey was conducted in March and April, 2009, to evaluate changes to the preliminary wetlands delineation. The revised survey revealed 2.72 acres of palustrine wetlands, 2.89 acres of lacustrine wetlands, and 5.26 miles of jurisdictional waters within the project area.

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*Fish and Wildlife Habitat*

Typical vegetation characteristics of the project area were recorded by biologists during an October 13-16, 2008, field survey. Three community types were identified; mixed forest, pasture, and rural/developed. Mixed forest communities are typically dominated by mature hardwoods with scattered pines and somewhat dense undergrowth. Pasture in the study area is located within the limits of a grassy power-line right-of-way. The rural/developed community is associated with roads, residences and commercial property and includes small areas of upland mixed forest and pasture, as well as mowed lawns, hardwoods, and ornamental trees and shrubs.

Vegetational characteristics of the project area vary with the landscape. In undeveloped areas vegetation includes plant species associated with the upland mixed forest and maintained pasture communities. Near the canal it is typically mature upland hardwood/pine forest with dense shrubbery. The electrical power-line right-of-way located alongside a portion of the canal consists of herbaceous species that are kept cut.

Riparian area species proliferating along the canal include water oak, willow oak, southern red oak, sweet gum, live oak, magnolia bay, Chinese tallow, red maple, persimmon, blackgum, loblolly pine, and black willow. Chinese privet and devils walking stick exist throughout the shrub layer. Common vines mixed throughout include peppervine, roundleaf greenbrier, and blackberry.

The canal edges and wetland areas feature common rush, smartweed, bushy bluestem, eastern baccharis, titi, beaked rush, St. Johnswort, alligator weed and arrowhead. In the power-line right-of-way and maintained pastures, noted species included Vasey's grass, dallisgrass, dogfennel, goldenrod, giant goldenrod, pokeweed, cogon grass, wax myrtle, little bluestem, and Bermuda grass.

*Fish and Wildlife*

Faunal communities noted in the project area include both aquatic and terrestrial species. Aquatic species are limited by the character of Canal No. 1 as a man-made channel for discharge of storm water. There is little flow during dry periods, so the canal is generally unsuitable for fish species. Canal No. 1 empties into Johnson Bayou which is part of the Bay of Saint Louis estuary. The estuary supports important fisheries resources, including spotted sea trout, redfish, brown and white shrimp and blue crab. The turbidity of water in Canal No. 1 impeded observation of aquatic species in the canal and precluded the identification of species below the surface. No sampling was conducted in connection with the field survey, but small fish of indeterminate species, as well as frogs, turtle and surface invertebrates were observed.

Terrestrial species in the project area include small mammals, reptiles, and avian species. Whitetail deer, raccoon, fox, and cottontail rabbit are common. The fox squirrel is found where deciduous trees are present on uplands, and gray squirrels occur along drainages. Common bird species include pine warbler, cardinal, summer tanager, Carolina wren, ruby-throated hummingbird, blue jay, eastern towhee, and tufted titmouse. Common snake species include cottonmouth, copperhead, rough green snake, rat snake, coachwhip, and speckled kingsnake. Fence lizards and glass lizards are also common.

The presence of wildlife in the project area is highly influenced by roadways and human development. Canal No. 1 and the drains which flow into it represent a vital source of water for wildlife species that inhabit the area, whether on a permanent or seasonal basis, as well as for species whose migratory routes traverse the corridor and for those which seek temporary shelter or forage in the vicinity of the canal.

#### *Threatened and Endangered Species*

The USFWS lists 15 species of plants and animals that are threatened or endangered that may potentially occur in Harrison County (see Table B). In addition, the bald eagle (*Haliaeetus leucocephalus*) is currently protected statewide under the *Bald and Golden Eagle Protection Act* and the *Migratory Bird Treaty Act*. None of the listed or protected species were observed during field surveys.

Table B. Federally Listed Species of Potential Occurrence in Harrison County

Common Name <i>Scientific Name</i>	Federal Status	Year Listed	Habitat Description
Alabama red-bellied turtle <i>Psuedemys alabamensis</i>	E	1987	Shallow vegetated streams, rivers, or backwaters
black pine snake <i>Pituophis melanoleucus lodingi</i>	C	N/A	Sandy, well-drained soils; open pine forests, moderate to sparse midstory; and well-developed herbaceous understory dominated by grasses
brown pelican <i>Pelecanus occidentalis</i>	E	1970	Coastal waters no more than 20 miles out to sea
gopher tortoise <i>Gopherus Polyphemus</i>	T	1987	Deep sand ridges which originally supported longleaf pine and patches of scrub oak
green turtle <i>Chelonia mydas</i>	T	1978	Coastal waters
gulf sturgeon <i>Acipenser oxyrinchus desotoi</i>	T	1991	Salt waters into large coastal rivers to spawn
Kemp's Ridley sea turtle <i>Lepidochelys kempii</i>	E	1970	Coastal waters
leatherback turtle <i>Dermochelys comacea</i>	E	1970	Coastal waters
loggerhead sea turtle <i>Caretta caretta</i>	T	1978	Coastal waters
Louisiana black bear <i>Ursus americanus luteolus</i>	T	1992	Bottomland hardwoods
Louisiana quillwort <i>Isoetes louisianensis</i>	E	1992	Sandy soils and gravel bars in or near shallow blackwater streams and overflow channels in riparian woodland/bayhead forests of pine flatwoods and upland longleaf pine
Mississippi gopher frog <i>Rana capito sevosa</i>	E	2001	Both upland sandy habitats historically forested with longleaf pine and isolated temporary wetland breeding sits
piping plover <i>Charadrius melodus</i>	T	1986	Coastal beaches
red-cockaded woodpecker <i>Picoides borealis</i>	E	1970	Open, mature, and old-growth pine ecosystems of the southeastern U.S.
West Indian manatee <i>Trichechus manatus</i>	E	1967	Large, slow-moving rivers, river mouths, and shallow coastal areas such as coves and bays

**Source:** U. S. Fish and Wildlife Service (2008) **Legend:** T – Threatened, E – Endangered, C – Candidate for listing.



## Flooding

In the Long Beach Watershed Plan and Environmental Impact Statement the project sponsors identified the flooding of homes and businesses as the major problem confronting watershed management planners. With proposed improvements to Canal No. 1 identified in the Watershed Plan-EIS still pending, flooding continues to be the major problem. This was painfully evident during Hurricane Katrina in 2005 when areas along both sides of the canal all the way from Johnson Bayou to Klondyke Road were inundated. This represents some 80 percent of the canal length included between the project limits of the Watershed Plan-EIS. Most of this flooding was, of course, caused by the tidal surge which pushed water from the Bay of Saint Louis into Bayou Portage and up the channels of connecting waterways. Nevertheless, flooding from major rainfall events continues to be a significant source of concern. The original Watershed Plan-EIS noted that there had been steadily increasing urbanization in the watershed since canals number 1 and 2-3 were constructed in 1918. Steadily expanding development has progressively reduced natural land cover, increasing runoff and the associated flooding due to shrinking drainage capacity.

### *Effects of Turkey Creek Overflow*

Turkey Creek Watershed lays North & East of and shares a common boundary with the Long Beach Watershed. It is well known that during time of peak flows, some of the Turkey Creek floodwater breaks over the watershed boundary along 28th Street and flows into the Long Beach Watershed. The effect of the Turkey Creek overflow on Canal No. 1 is a major concern to the residents downstream. The quantity and timing of any overflow from Turkey Creek down Canal No. 1 will affect both the existing function of the channel as well as the design of the modified channel. Further investigation into the Turkey Creek overflow was warranted and conducted to answer these concerns.

The original planning determined that the vast majority of the overflow that occurred from Turkey Creek was transported downstream by Canal No. 2-3. As a result, hydrographs of the expected overflow from Turkey Creek for the various storm frequencies were developed and used in the hydrologic analysis of Canal No. 2-3. The hydrologic analysis of Canal No. 1 did not include any overflow from Turkey Creek. Various documents have been found that support this view. An NRCS trip report in 1985, during the flooding following Hurricane Juan, only reported on flow into Canal No. 2-3 from Turkey Creek. Consulting engineers in 1986 reported that the most serious flooding along Canal No. 2-3 is due to overflow from Turkey Creek.

Analysis of USACE cross-sectional survey data and the latest available (Post Katrina) LiDAR elevation data yielded much information. The analysis concentrated on a 3,500 foot long stream reach of Canal-1 that is just downstream of 28th street. Canal No. 1 and Canal No. 2-3 are hydraulically connected and share a common 100-year floodplain within this reach. Downstream of this common floodplain the two canals separate into unique stream systems that are not hydraulically connected. The Canal No. 1 stream reach is largely located within the U.S. Naval Reservation at Gulfport.

It is obvious that the general topography slopes downward from east to west or from Canal No. 1 to Canal No. 2-3. Canal No. 2-3 generally has a more defined stream channel and much greater flow capacity

overall than Canal-1 within this reach. It is also obvious that the channel elevation of Canal No. 1 is approximately three to five feet higher than the channel elevation of Canal No. 2-3 in a given section. Canal No. 2-3 in general has significantly more conveyance than Canal No. 1 given the same elevation. This difference in elevation/conveyance between the two channels indicates that floodwater from Canal No. 1 will overflow into Canal No. 2-3, but the reverse is not likely to occur. Overflow from Canal No. 1 within this reach will migrate toward Canal No. 2-3 while overflow from Canal No. 2-3 will just be conveyed downstream in the overbank section.

LiDAR also shows two areas within the Navy Reservation where the flow of water down Canal No. 1 will be disrupted. One area appears to be a low water crossing where the channel is partially blocked and the flow is diverted west toward Canal No. 2-3. The other area shows a significant break in the dike on the west side of the channel that allows flow to escape Canal No. 1 and go west toward Canal No. 2-3. Once again it should be noted that once water overflows or is diverted from Canal No. 1 into Canal No. 2-3, it is lost to the Canal No. 1 system and will not be replaced.

Additional questions have been raised on how the planned improvement to Canal-1 will affect the quantity and timing of overflow from Turkey Creek as well as the remaining flow down Turkey Creek. The improved channel is located far enough downstream that there is no change in the backwater effect from Canal-1 at the area that the Turkey Creek overflow occurs near 28th Street. This means that there is no change in overflow from Turkey Creek to the Long Beach Watershed expected for any given storm. The implementation of Canal-1 will not affect the quantity or timing of overflow from Turkey Creek for any given storm. Also, the implementation of Canal-1 will not affect the quantity or timing of flow down the Turkey Creek Watershed for any given storm.

In summary, all analysis conducted supports the original planners decision that the vast majority of any overflow from Turkey Creek will be transported downstream by Canal No. 2-3. Although some overflow from Turkey Creek could eventually make its way down Canal No. 1, the amount would be limited to the minimum channel capacity of Canal No. 1 within this reach and would be insignificant when compared to the storm discharges used for the downstream analysis. It should also be noted that due to the increased distance that any overflow from Turkey Creek would have to travel, it would likely not add directly to the peak flow on Canal No. 1, but would instead just prolong the flow after the peak.

## **Development of Alternatives**

The primary objective of the Sponsors is to reduce the \$1,069,300 in annual damages due to flooding. Both the original 1989 environmental study and the more recent USACE analysis made use of hydraulic modeling to determine the extent of existing exposure to flooding conditions and to evaluate the potential benefits of both structural and nonstructural measures. In formulating the original alternatives, it was determined that the topography of the area limited the available structural measures for reducing flooding to clearing and snagging, selective snagging, channel enlargement and a levee. The nonstructural measures given consideration included warning techniques, the purchase of existing structures and relocation of residents and businesses, and simple flood proofing techniques. An incremental analysis was undertaken in order to determine the cost-effective channel section that would minimize the risk to public safety due to flooding.

## **Description of Alternatives**

Three alternatives were evaluated for the original Watershed Plan-EIS. Alternative No. 1 was the "No Action" option, furnishing a base condition by which to measure the effects of other alternatives. Projected average annual damages due to flooding in the Canal No. 1 floodplain would be unaffected by foregoing implementation of the project.

Alternative No. 2 is the recommended alternative, consisting of improvements on Canal 1 which includes 3.8 miles of earth-lined channel, 0.2 miles of riprap lined channel, and 0.7 miles of selective snagging.

For 2014, the updated costs are \$1,895,700 for construction, \$930,400 for Land Rights, and 407,600 for Technical Assistance (Engineering, Construction Inspection, and Project Administration), for a total cost of \$3,233,700.

## **Alternatives Considered but Eliminated from Detailed Study**

Alternative No. 3, the nonstructural option, involves moving, closing in, elevating or building floodwalls around approximately 121 buildings at a cost of \$7,629,300 (NRCS,1989:25 updated to 2014 costs).

U.S. Department Agriculture  
Natural Resources Conservation Service

08-03

Watershed: Long Beach  
County/State: Harrison County, MS  
Canal No. 1

**Table C. Environmental Evaluation for  
Watershed Planning/Comparison of Alternatives**

**Purpose:** These tables document existing resource concerns/conditions and summarizes the effects and impacts of proposed watershed alternatives and activities on natural, human, and cultural resources.

### National Economic Development Account

	No Action	Preferred Alternative 2
<b>Project Investment</b>	\$0	\$3,233,700
<b>NED Account</b>		
Beneficial Annual	\$0	\$492,200
Adverse Annual	\$0	\$122,900
Net Beneficial	\$0	\$369,300

### Regional Economic Development Account (RED)<sup>1/</sup>

#### Other Social Effects Account

	No Action	Preferred Alternative 2
Health and Safety	See Comments	See Comments
Impact to Rural Development	Continued flood damages	Decreased flood damages
Impact Disadvantaged Persons	Continued flood damages	Decreased flood damages
Social well-being	Heightened anxiety	Maintained
Maintaining Productivity	Continued flood damages	Decreased flood damages
Beneficiaries (number)	None	310 Beneficiaries
Bridges/Roads Benefited (number)	None	Six roads
Business/Homes/Public Facilities Benefited <sup>3/</sup>	None	103 homes and 18 businesses with reduced flooding
Domestic Water Supplies	None	None
Other	See Comments	See Comments

<sup>1/</sup>The RED Account was not included in the plan since it was not identified as an issue during plan development

### Environmental Quality Account

	<b>No action Alternative 1</b>	<b>Preferred Alternative 2</b>
Threatened/endangered species	Not likely to adversely affect	Not likely to adversely affect
Landscape resources (aesthetics)	Maintain existing resources	Maintain existing resources
Streams/corridors enhanced/protected (miles)	Maintain existing resources	Maintain existing resources
Lakes/reservoirs/enhanced protected (surface acres)	Maintain existing resources	Maintain existing resources
Water quality	No effect	Short-term negative impact due to construction activities
Wetlands (acres)	Maintain existing resources	Loss of 0.01 acres of palustrine wetlands
Upland/riparian habitat created/enhanced (acres)	Maintain existing resources	Maintain existing resources with mitigation plan
Air quality	No effect	Short-term minor negative impact due to construction activities
Clean Water Act	No effect	404 permit may be required
Clean Air Act	No effect	Permits may be required
Cultural resources	No effect	No effect
Fish and wildlife habitat	No effect	Loss of 61 acres riparian habitat. Compensatory mitigation gain of 61 acres riparian and 58 acres hardwood tree plantings.
Land use	Increased flood damage	Decrease flood damage
Riparian area	No effect	Maintain existing resources with mitigation plan
Floodplain management	No flood protection	Increased flood protection
Stream channel modification	None	Increase stream channel capacity
Environmental Justice	No effect	No effect
Migratory Bird Treaty Act	No effect	No effect
Essential Fish Habitat	None present	None present
Natural Areas	None present	None present
Parklands	None present	None present
Ecologically critical areas	None present	None present
Invasive Species	No effect	No effect

#### Comments:

**Cultural Resources:** If cultural resources are discovered during implementation, then policies and procedures found in NRCS General Manual 420 part 401 and National Cultural Resources Procedures Handbook (H\_190\_601) will be initiated. According to a letter dated March 10, 2009, the Mississippi Department of Archives and History concurs with the findings of the cultural resources survey conducted by Earth Search in October of 2008.

**Health & Safety:** School bus routes, emergency vehicle access, and access to towns and medical facilities will be affected during flood events for the No Action alternatives.

**Impact to Disadvantaged Persons:** People are adversely affected by flood events during the No Action alternative. Figure No. 2 displays the U. S. Environmental Protection Agency's 2010 Environmental Justice map of the minority groups along Canal No. 1. The northwest side of Canal No. 1 has a population that is 0-10% minority and the southeast side of Canal No. 1 is 10-20% minority. Figure No. 3 displays the poverty level groups along Canal No. 1; the northwest side of Canal No. 1 is 10-20% below the poverty level and the southeast side is 0-10% below the poverty level.

## Other

*Air Quality:* The short-term negative impacts are minor air pollution increases inherent to construction activities.

*Cumulative Effects:* The modification to Canal No. 1 for the Preferred Alternative will provide increased flood protection to houses and businesses located along the canal.

## **Risk and Uncertainty**

### Engineering

The structural information for the planned channel improvement is based on data collected and analyzed for the 1989 planning effort. All costs are estimated based on those quantities. There is a potential for changes in actual quantities when final surveys and designs are completed. Unit costs are estimated, and may change during contracting. The actual location for placement of excavated materials has not been located, but land rights costs and transportation costs have been estimated and included in the alternative cost.

### Hydrology and Hydraulics

The original planning for the Long Beach Watershed was completed in 1989. The original hydraulic and hydrologic (H&H) models and channel design were to be used for all analysis needed to complete the updated EIS. However, the final H&H runs could not be located in the files. A decision was made to use the best data available to update the depths of inundation at each structure needed for economic analysis. A matching set of WSP2 and TR20 runs for each alternative (Present and Future Condition) dated October of 1987 were selected for use. A thorough check of these runs did not reveal any major problems with the input/output that would raise concerns about the accuracy of the results. It should be noted that the results of these H&H runs do not match the results in the final plan. However, since the economic analysis is based on the relative difference between the two alternatives, these runs are considered more than adequate for this task. Care has been taken to refer to any results taken from these runs in general terms or as differences between alternatives rather than specific numbers to avoid confusion.

Additional analysis was conducted to determine the effects of the project on the area downstream of the designed Canal-1 channel or downstream of Espy Avenue. The downstream area was analyzed by modifying an existing USACE HEC-RAS model to run a steady flow analysis for each alternate using the peak discharges produced by the corresponding TR20 model. The model used for the downstream analysis provides sufficient detail to determine the downstream effects of the project on flora and fauna. This method was also utilized to determine the effects of the project on the existing houses and businesses located downstream of the improved channel. It should be noted that the successful use of this method depends not only on the accuracy of the model used, but also on the accuracy of the discharges used and the house and business inventory.

It is highly recommended that new hydrologic & hydraulic models be developed during the final design that covers Canal-1 from 28th Street downstream to the bay. This comprehensive model will allow any updates needed to the hydraulics or hydrology to be made and can incorporate any changes made to the final Canal-1 design. This model should be used to update the appropriate Flood Insurance Rate Maps

(FIRMs) needed to comply with the National Flood Insurance Program (NFIP). The final design phase should also include a check of the existing house and business inventory to update any changes needed. The updated inventory and model will ensure that all downstream effects of the constructed channel on current improvements have been accurately identified and mitigated for.

### Economics

A database of houses used by the U.S. Army Corps of Engineers for the Section 205 Turkey Creek Flood Damage Reduction Study was used as a base to gather information on houses in the floodplain. The houses were then ground checked to determine which houses had been demolished, rebuilt to new elevations and also for new construction. The Harrison County Assessor website was used to update house values for completing the economic analysis.

## Environmental Consequences

### Flooding

#### *Floodplain Management*

There is not a significant change in the extent of the existing mapped floodplain expected due to the construction of the improved channel. The floodplain upstream of the improved Canal No. 1 is already zoned and changes to the existing boundaries will be limited. The floodplain downstream of the improved channel is controlled by the 100-year tidal surge and the existing boundary will not change. The most significant change to the existing floodplain will occur within the 3.8 mile length of the improved channel. The average width of the 100-year floodplain will decrease approximately 150 feet between without and with project conditions. The smaller storms will have an even greater decrease in the average width between without and with project conditions due to a higher percentage of the flow being carried within the channel. For example, the average width of the 5-year floodplain will decrease approximately 550 feet between without and with project conditions. The without and with project floodplain is well documented in the original Long Beach Watershed Plan. Appendix B of this document contains maps showing the extent of the 100-year and 500-year floodplains for both without and with project conditions.

Even though there is not a significant change expected in the regulated floodplain due to the construction of Canal No. 1, it is highly recommended that the current Flood Insurance Study (FIS) and appropriate Flood Insurance Rate Maps (FIRMs) be updated during the final design stage if and when the project is accepted and funded. Updating the floodplain during the final design will allow any updates needed to the hydraulics or hydrology to be made and can incorporate any changes made to the final Canal No. 1 design.

The potential enlargement of Canal-1 will reduce the existing floodplain and could result in more development around the canal in the future. This expectation of increased runoff was considered and included in the future with project condition analysis. It has been suggested that this reduced floodplain be preserved as undeveloped area in order to reduce potential runoff. The NRCS certainly has no objection to leaving the reduced floodplain area undeveloped to help minimize future flooding. In this case, the existing floodplain maps could be used as is. In any case, the existing floodplain regulations should be strictly enforced to minimize encroachment and reduce the runoff potential.

#### *Floodwaters*

The following demonstrates the average difference in elevation, top-width, and velocity expected between the without and with project conditions for Canal No. 1. The average difference in elevation will decrease approximately 0.9 feet for the 100-year flood event, 1.0 feet for the 10-year flood event, and 1.3 feet for the 1-year flood event. The average difference in total width will decrease approximately 150 feet for the 100-year flood event, 450 feet for the 10-year flood event, and 400 feet for the 1-year flood event. The average difference in flow velocity will increase approximately 0.3 feet per second (Ft/S) for the 100-year flood event, 0.5 Ft/S for the 10-year flood event, and 0.6 Ft/S for the 1-year flood event.



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### *Flood Damages*

There are 121 structures including homes and businesses that are located within the 500-year floodplain along Canal No. 1. These structures will benefit from the modifications to Canal No 1. By decreasing the depth of flooding along the canal. There will be a reduction of approximately \$428,000 in average annual flooding damages.

### *Public Health and Safety*

There are no public health issues associated with the construction of the canal. There will be a decrease in the depth of flooding along the canal during flood events which will help with flooding of roads and bridges.

### Natural Environment

#### *Water Quality*

As stated in the original Watershed Plan-EIS (on page 52), the primary impact to water quality is urban runoff. The proposed project will have little impact on the water quality of the canal. The point discharge sites empty into lateral ditches before entering the canal and therefore, the proposed action will have little effect on these sources. Canal No. 1 is not included in the Mississippi Department of Environmental Quality (MDEQ) "List of Impaired Water Bodies" (MDEQ 2009).

Again, as stated in the original Watershed Plan-EIS, the effect on the downstream water quality of Johnson Bayou will be limited because the detention time in the canal will change only slightly. Turbidity levels may temporarily increase during construction and before vegetation is established, however, timing of construction and construction techniques will be used to minimize the effects of increased turbidity levels. Sediment decreasing construction techniques include sediment traps at the lower end of the channel, vegetation of spoil, berm, and channel slopes every 500 feet of construction, and channel side slopes constructed at 3:1. Water quality impacts due to construction of channel 1 are not expected to violate any state water quality standards.

The removal of materials impeding flow in the canal, in sections to be improved by means of selective snagging, would be accomplished primarily with hand-operated equipment, water-based equipment, or other small equipment used in a manner intended to minimize soil and water disturbance.

#### *Wetlands and U.S. Jurisdictional Waters*

The survey effort determined there would be direct impacts on jurisdictional wetlands and waters of the United States. This includes 2.72 acres of palustrine wetlands, 2.89 acres of lacustrine wetlands, 4.56 miles of Canal No. 1 and 0.7 miles of ditches. However, the only permanent resource loss anticipated as a result of the project involves a fingerlike projection of palustrine wetland located on the south side of the canal immediately east of milepost 14500. Widening of the channel at this point would cause the loss of less than 500 square feet (approximately 0.01 acre) of existing wetland which would either be excavated to expand the canal or filled to stabilize the canal bank. During the design phase the engineers will work

with NRCS biologist to choose access points that have higher concentrations of invasive species or non-sensitive plant communities. Access will be accomplished by moving from one access side to the other without crossing the canal with equipment.

Other than this one wetland impact, it is not anticipated that any jurisdictional waters will be filled in connection with the project. The purpose of the project is to clear and/or widen the existing channel in order to increase its carrying capacity and enhance its operational functionality. The centerline of the channel will be realigned in some sections in order to avoid impacts to delineated wetlands. In most cases relocation of the centerline will be limited to 10-20 feet; in no case will it exceed 50 feet. As the bottom width of the canal will be widened to 30 to 40 feet along most of its length, realignment of the centerline as little as 10-20 feet may be only a matter of excavating on one side of the existing channel rather than the other. These are details that will be addressed in the design phase of the project. Where the canal is shifted or expanded away from a connecting ditch or other water course, it may or may not prove necessary to extend the tributary to maintain the connection. Where the canal is shifted or expanded toward a ditch or other water course, it is possible some portion of the tributary would be subsumed by the widened channel. However, it is not expected that any portion of a connecting waterway would be filled.

#### *Fish and Wildlife Habitat*

Any impacts to flora in the project area resulting from the modification of Canal No. 1 will be minor and temporary. Reforestation of approximately 61 acres temporarily cleared within the channel right-of-way will be accomplished and an additional 58 acres of tree plantings will be accomplished on cleared land within the watershed.

#### *Fish and Wildlife*

Any impacts to fish and wildlife habitat in the project area resulting from modification of Canal No. 1 will be minor and temporary. Approximately 61 acres of riparian area will be cleared within the channel right-of-way. Reforestation of this acreage of riparian area will be accomplished along the channel boundaries and an additional 58 acres of tree plantings will be completed on cleared land within the watershed. Some migratory bird habitat will be lost due to clearing of 61 acres of riparian timber along the canal, but will be replaced by mitigation area plantings.

There are no known federal or state threatened or endangered species in the work area. No changes in salinity are expected in the work area due to construction of project.

#### *Threatened and Endangered Species*

The USFWS has concurred that “there are no known federally listed threatened or endangered species, or their habitats, within the project area. Therefore, the Service anticipates no impacts to any listed species to occur as a result of the proposed project.” However, to minimize the potential for downstream impacts on state or federally listed threatened or endangered species or their habitat, in Johnson Bayou, Bayou Portage, the Bay of Saint Louis or environs, suitable measures will be taken to prevent increased siltation

and deposition of added sediment below the western limit of the Canal No. 1 project at Espy Avenue both during and after construction of the proposed improvements. These measures include construction of earth-lined channel sections with 3:1 side slopes; vegetation of spoil berm and channel slopes after every 500 feet of construction; and installation of sediment traps at the downstream end of the constructed channel.

### *Soils*

General soil types identified in the Soil Survey of Harrison County were reviewed and compared with the list of hydric soils obtained from the NRCS. Hydric soils found to be present in the Canal No. 1 corridor included the following: Atmore silt loam, Hyde silt loam, Plummer loamy sand, and Ponzer and Smithton soils. A hydric soil is defined as one formed under conditions of saturation, flooding or ponding prolonged sufficiently during the growing season to develop anaerobic conditions in the upper part (Environmental Laboratory 1987). Low-chroma color, an indicator of hydric soils, was observed at all sample plot. Re-vegetation of the area along Canal No.1 may be affected by the anaerobic soil conditions. This may result a longer re-establishment period than normal conditions.

### *Hydrology*

The natural hydrology of the project corridor has been altered significantly by urban development. Hydrological indicators observed by surveyors included inundation, saturation in the upper 12 inches, drainage patterns in wetlands, oxidized root channels in the upper 12 inches and water-stained leaves. Five of the 14 sample plots (A, B, C, D and E) showed signs of hydrological activity, including inundation, saturation in the upper 12 inches, drainage patterns, sediment deposits, water-stained leaves and oxidized root channels in the upper 12 inches. Two plots (U1 and U2) revealed no indications of hydrology.

### Cultural Resources

Earth Search, Incorporated (ESI) conducted a Phase 1 survey and cultural resources management assessment for the proposed channel modifications to Canal No. 1 during a three-day period from October 15 through 17, 2008. The Phase 1 survey effort included both archaeological and architectural surveys. Before undertaking the fieldwork, ESI researchers performed a comprehensive search of the relevant literature and reviewed the pertinent public records on file at the Mississippi Department of Archives and History (MDAH) in Jackson. Materials reviewed recorded standing structures in the area. Other materials examined included geomorphological data, maps and aerial photography. Preliminary historical investigations included secondary documentation located in local and regional archives and record depositories. The archaeological survey covered an Area of Potential Effect (APE) parallel to the canal and within 30 meters, or a little less than 100 feet, of either side of the channel. For the purposes of the architectural survey, the APE encompassed a quarter-mile buffer surrounding the waterway.

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*Previous Investigations*

Research at MDAH revealed that 13 previous cultural resources surveys have been undertaken within one mile of Canal No.1. However, four of the 13 survey reports were not available for review. By examining the other nine, ESI researchers determined that one archaeological site and numerous standing structures 50 years of age or older have previously been recorded within a one-mile buffer area. A December 2000 survey by James Lauro identified one early-to-mid-20th-century site which has not been catalogued by MDAH. A February 2007 survey, in connection with the proposed construction of a new Harper McCaughan Elementary School to replace the facility destroyed by Hurricane Katrina, uncovered what was believed to have been the historic site of Hahn Brothers Nursery. The site was assigned a catalogue number (22HR973) but determined to be ineligible for nomination to the National Register of Historic Places (NRHP). A total of 29 structures at least 50 years old were located within one mile of the Canal No.1 project area. Of those, one is listed on the NRHP, three are considered eligible for nomination to the NRHP and six are considered potentially eligible.

*Archaeological Survey*

Field investigations in the project area consisted of pedestrian survey with judgmental shovel testing. Two transects, one on either side of the canal within 30 meters (less than 100 feet) of the bankline, were surveyed. Shovel-testing was limited to high-probability areas defined on the basis of the local geomorphology. Excavations were 30 centimeters (12 inches) in diameter with a maximum depth of 50 centimeters (20 inches). Excavated soils were screened through quarter-inch mesh. All soils were replaced upon completion of testing. The Mississippi Department of Archives and History concurs with the findings of the cultural resources survey, according to a letter dated March 10, 2009.

Most of the project area was cleared, allowing excellent visibility for the pedestrian survey. While recent debris (bottles, cans, etc.) was much in evidence, there were no signs of any artifacts sufficiently aged to warrant further investigation. Shovel tests in the high-probability areas revealed two strata. The upper consisted of a mix of very dark grayish brown soil and light gray sand to a depth of 35 centimeters (or 13.8 inches). The lower was a layer of unmixed light gray sand from 35 centimeters below the surface to the maximum depth of the excavation (50 centimeters or 20 inches). All shovel tests were negative, and there was no evidence of culture-bearing strata in the project area. Nevertheless, if cultural resources are discovered at anytime during the implementation of the project, work should cease until the Mississippi Department of Archives and History (MDAH) can assess the significance of the find and make a recommendation regarding how any such discovery should be handled. In the event of inadvertent discovery of cultural resources, NRCS will follow its discovery procedures as outlined in the Mississippi State Level Agreement. If excavated materials are to be stored, yarded, or spread off-site in new or unevaluated areas, these new areas in most cases will require an archaeological inventory as well as additional consultation.

### *Architectural Survey*

An APE spanning 400 meters (.25 mile), 200 meters on either side of the canal, was established for the purposes of the architectural survey. All standing structures at least 50 years old, located within the limits of the APE, were to be recorded on MDAH Historic Resource Inventory forms. Digital photographs were also to be taken to document the appearance of recorded structures. However, only one culturally significant site was identified. The Resource Inventory form and digital photographs of the Courtenay Cemetery may be found in the Phase 1 Cultural Resources Survey report. The unmarked cemetery is located approximately 100 meters (a little less than 330 feet) due east of Espy Avenue. Access is via an easy-to-miss unsigned gravel lane, and there is no gateway or other entrance to the historical/contemporary burial ground. The cemetery, while roughly square, shows no indication of having lain out according to any plan. Grave markers are randomly distributed among the oaks and other shade trees. No other improvements are visible. There are approximately 50 markers, but the names and dates on some are indiscernible. There is a single brick-masonry tomb which appears to represent the earliest interment in the cemetery. All other burials are below the surface. There is also a granite obelisk and several simple folk-style markers made of poured concrete covered in tile. The earliest burial date is 1892; the majority fall between 1950 and 1980. As the nearly hidden cemetery lies on the very edge of the one-eighth-of-a-mile project area buffer, channel modifications will have no effect on the property.

### Downstream Effects of Project

Long Beach Canal 1 was designed to end at the limits of the 100-year tidal surge which occurs along Espy Avenue. The area downstream of Espy Avenue was not modeled or analyzed during the original planning. This has left many questions and concerns unanswered on the projects effect on downstream development and aquatic resources. A HEC-RAS model was developed to determine the effects of the project downstream of the proposed channel. The following analysis shows us the average difference in velocity and elevation expected between the pre-project and post-project conditions.

The channel between Espy and Menge Avenues has seen significant modification and increased development over the years. The results of the modeling show that there is a small increase in storm elevations expected for this area. The larger storms (25-year to 500-year) produced no change in velocity but had an average increase in elevation of 0.35 feet. The smaller storms (1-year to 10-year) produced an average increase in velocity of 0.19 F/S and an average increase in elevation of 0.57 feet. The greater increase in the velocity and elevation for the smaller storms is due to the fact that the smaller storms are more confined to the channel and are less dependent on the floodplain.

The channel enters Johnson Bayou just downstream of Menge Avenue. This area is mostly undisturbed and considered rich in aquatic resources. The results of the modeling show that there is no significant change in either elevation or velocity for the area downstream of Menge Avenue. The larger storms (25-year to 500-year) produced an average increase in velocity of 0.02 F/S and an average increase in elevation of 0.06 feet. The smaller storms (1-year to 10-year) produced an average increase in velocity of 0.06 F/S and an average increase in elevation of 0.13 feet. The greater increase in the velocity and

elevation for the smaller storms is due to the fact that the smaller storms are more confined to the channel and are less dependent on the floodplain.

By the time the floodwaters get to the confluence of Johnson Bayou and Bayou Portage, there is not a measurable difference in the without and with project elevation and velocity results for any storm modeled. It is obvious that as you proceed downstream from the improved Canal-1 that the difference in without and with project conditions rapidly dissipates. Due to the extremely minor changes in velocity and elevations downstream of the work area, it is expected that there will be no downstream effects on flora and fauna due to installation of the project. There are no direct or indirect impacts anticipated to tidal and tidally influenced waters or wetlands located downstream of the Canal-1 project. Additionally, there are no anticipated impacts to any tidal or non-tidal areas located downstream of the proposed action area.

The downstream boundary conditions used for these runs were critical to provide meaningful results. The average high tide was used for the starting elevation of the analysis shown. It should be noted that as the downstream boundary elevations get higher due to storm surge, the differences between the pre-project and post-project runs become even smaller.

Two residential houses located just upstream of Menge Avenue will incur increased flooding as a result of this project. Neither house is currently inundated by the 100-YR storm under pre-project conditions, while both houses are inundated by the 500-YR storm under pre-project conditions. The completed project will increase the average depth of the 500-year storm at the two houses an average of 0.19 feet. In addition, the two houses would be inundated by depths of 0.13 feet and 0.61 feet by the 100-year storm under post project conditions. A build out or population growth analysis along Canal No. 1 was not conducted, it is evident from the site visit that many of the houses that were damaged or destroyed by Hurricane Katrina were not rebuilt. New construction is regulated by the local floodplain management board.

### Cumulative Effects

The modifications to Canal No. 1 will provide average annual benefits of \$492,200 from reduced flooding. The combination of the improvements of Canal No. 1 and Canal No. 2-3 will provide even more benefits to the residents and business owners along both canals. The most significant change to the existing floodplain of Canal No. 1 will occur within the 3.8 mile length of the improved channel. The average width of the 100-year floodplain will decrease approximately 150 feet between without and with project conditions. The smaller storms will have an even greater decrease in the average width between without and with project conditions due to a higher percentage of the flow being carried within the channel. For example, the average width of the 5-year floodplain will decrease approximately 550 feet between without and with project conditions.

The improvements to Canal 2-3 that were completed in 2012 have provided reduced flooding to structures with no known negative impacts to the surrounding environment.

## **Consultation, Coordination, and Public Participation**

### **Project Coordination**

Information regarding public and agency involvement in development of the original Long Beach Watershed Plan and Environmental Impact Statement may be found in the “Consultation and Public Participation” section of the Watershed Plan-EIS (SCS, 1989:65). “Letters of Comment Received” from interested agencies were attached as Appendix A of that document. Written comments were submitted by the U.S. Environmental Protection Agency, the U.S. Department of Commerce, the U.S. Department of Health and Human Services, the Mississippi Department of Wildlife, Fisheries and Parks, and the U.S. Department of the Interior. A public meeting was held at the Long Beach Public Library on July 17, 1989 for the purpose of presenting the Draft Watershed Plan-EIS and affording an opportunity for area residents and other interested individuals to submit comments regarding the plan. The meeting was attended by 33 persons. Those submitting comments were generally in support of the project, although some expressed concern about the fact that it would not go beyond Espy Avenue in Pass Christian. “These concerns were adequately addressed during the course of the meeting,” according to the original report.

### **Agency Coordination**

As previously noted in Section 1.2 (Project Scoping) agency coordination for the SEIS update of the original Watershed Plan began with a scoping meeting held on August 14, 2007. The following agencies were represented at that meeting: the Long Beach Water Management District, one of the principal sponsors of the original study; the Natural Resources Conservation Service, successor agency to another of the principal sponsors (the Soil Conservation Service); the U.S. Army Corps of Engineers, a cooperating agency for the present study; and the Mississippi Forestry Commission.

Letters soliciting the views of officials representing potentially interested agencies and organizations were sent to representatives of the following:

Jena Band of Choctaw Indians

Mississippi Band of Choctaw Indians

Tunica-Biloxi Indians of Louisiana, Inc.

U.S. Army Corps of Engineers – Mobile District

U.S. Department of Agriculture – Mississippi Farm Service Agency

U.S. Department of Agriculture – Forest Service

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U.S. Department of Agriculture – Natural Resources Conservation Service

U.S. Environmental Protection Agency

U.S. Fish and Wildlife Service

National Marine Fisheries Service

Mississippi Department of Marine Resources

Mississippi Department of Environmental Quality

Mississippi Department of Finance and Administration

Mississippi Department of Archives and History

State of Mississippi – Office of the Governor

Mississippi State Director of Rural Development

Mississippi Department of Wildlife, Fisheries and Parks – Natural Heritage Program

Mississippi Forestry Commission

Mississippi Soil and Water conservation Commission

Mississippi Department of Transportation

Southwest Mississippi Planning and Development District

Gulf Regional Planning Commission

Gulf Restoration Network

Responses were received from individuals representing six of the contacted agencies: the U.S. Environmental Protection Agency; Mississippi Department of Marine Resources; Mississippi Department of Wildlife, Fisheries and Parks; the Jena Band of Choctaw Indians; the U.S. Fish and Wildlife Service; and the U.S. Army Corps of Engineers. Copies of the Solicitation of Views (SOV) letter and all responses received may be found in Appendix 1. The following comments – some of which have already been addressed directly in previous chapters – were offered in the letters of response.

U.S. Environmental Protection Agency – In a letter dated January 2, 2009, Heinz J. Muller, chief of the NEPA Program Office, Office of Policy and Management, recommended that the SEIS include discussion of impacts on “existing hydraulics and hydrology (including...changes in the FEMA designated floodplain and the ‘adopted regulatory floodway’), protected species, soils, geology, hazardous materials, underground storage tanks, the transportation network, recreational opportunities, air quality, noise, cultural resources, aesthetics, socioeconomics, and land use.” On behalf of the EPA Region 4 Water Protection Division, he also asked that the SEIS “include an analysis of how the proposed project could



(or will) serve as a diversion canal for any adjacent streams.” This request had particular reference to the Turkey Creek basin, an EPA priority watershed.

Mississippi Department of Marine Resources – In a letter dated December 18, 2008, Greg Christodoulou, coastal resource management specialist, noted that while it seemed unlikely tidal systems would be directly affected by the project, the SEIS should address “indirect impacts to tidal and tidally influenced waters and wetlands located... downstream from the proposed action area.”

Mississippi Department of Wildlife, Fisheries and Parks – In a letter dated December 4, 2008, Andy Sanderson, Mississippi Natural Heritage Program ecologist, noted that “the Mississippi coast has suffered a great deal of habitat loss since the agency last commented on this project” in 1989. He also noted the presence of five protected species (manatee, saltmarsh topminnow, Mississippi diamond back terrapin, gulf salt mash snake and least killifish) in Saint Louis Bay, Bayou Porage, tributary streams and adjacent marshes. Nothing that channel improvements can “increase storm water runoff conveyance and stream flow velocities, and potentially increase transport of contaminants” he stressed the need for precautions to prevent erosion and sedimentation. He also recommended that measures be implemented to forestall the potential disturbance or loss of wetlands due to increased development resulting from a reduction in the risk of flooding.

Jena Band of Choctaw Indians – Environmental Director Lillie McCormick stipulated, in a letter dated December 23, 2008, that the project would not have a significant impact on any property held by the Jena Band of Choctaw Indians.

U.S. Fish and Wildlife Service – Fish and Wildlife Biologist David Felder confirmed, in a letter dated May 4, 2009, “There are no known federally listed threatened or endangered species, or their habitats, within the project area. Therefore, the Service anticipates no impacts to any listed species to occur as a result of the proposed project.”

U.S. Army Corps of Engineers – In a letter dated December 2, 2008, John McFadyen of the Mobile District acknowledged receipt of the solicitation of views letter regarding the project and noted that he would serve as project manager for the Corps. In a follow-up email on December 22, 2008, Mr. McFayden said that USACE officials had indicated their desire to have the Corps included as a cooperating agency in the development of the Supplemental EIS for Canal No. 1 improvements.

### Public Involvement

Public involvement in the development of the original Watershed Plan-EIS dates from as early as January 16, 1986 when a meeting was held with affected property-owners to discuss the need for a “study [of] the effects of Turkey Creek overflowing into the Long Beach Canal No. 1” (SCS, 1989:56). As noted above, a public meeting was held at the Long Beach Public Library on July 17, 1989 for the purpose of presenting the Draft Watershed Plan-EIS and receiving comment on it.

### Public Meetings

August 14th, 2007 – Scoping meeting was held to discuss updating the SEIS.

November 19, 2013 – A meeting was held between the Oklahoma NRCS and sponsors to discuss the project.

February 4<sup>th</sup>, 2015 – A public meeting is scheduled to present the updated SEIS.

### Preferred Alternative

Overall the Recommended Alternative would involve improvements to roughly 4.7 miles of Canal No. 1 between the NCBC and Espy Avenue, including 3.8 miles of earth-lined channel construction, about two-tenths of one mile of rock riprap-lined channel construction and seven-tenths of one mile of selective snagging. As noted in the original Watershed Plan-EIS, the earth-lined channel sections will be constructed with 3:1 side slopes due to the sandy bank materials (SCS, 1989:30). The plan initially called for most construction to be performed from one side of the canal with most spoil being deposited on one side as well. This aspect of the plan has been modified slightly to include the removal of spoil material from the project area and its transport to a suitable deposition site. The channel section reinforced by the placement of rock riprap will be constructed with 2:1 side slopes in order to provide adequate flow capacity within the narrower canal segment. The rock lining will prevent erosion due to accelerated water velocity from the Beatline Road crossing to the point 950 feet downstream at which the channel widens out again. Earthen channel slopes and berms will be re-vegetated after every 500 feet of construction, or at least weekly, soil moisture conditions permitting. This will serve to stabilize the banks, inhibiting erosion and reducing the excess sedimentation that might otherwise occur during construction.

In order to minimize the impact of proposed improvements on wetlands and natural habitat areas located along Canal No.1, the recommended alignment of the canal was modified at selected locations as shown in Exhibit A - Conceptual Alignment. (Conceptual alignment drawings will be found in Appendix C). The route of the canal improvement will remain within the floodway boundaries. The upstream end of the project is located where Canal No. 1 flows out of the Naval Construction Battalion Center (NCBC) and into the City of Long Beach proper. The Recommended Alternative calls for selective snagging in the first 0.7 miles from the eastern city limits to the vicinity of Commission Road. The canal right-of-way would be 100 feet wide throughout this section and would be located immediately south of a 100-foot Mississippi Power Company servitude beginning roughly 1,560 feet west of the east end of the project. The canal would have a bottom width of 10 feet. A grade control structure would be installed on the upstream side of the Commission Road crossing. The existing canal alignment would be altered slightly beginning on the downstream side of Commission Road in order to pass between two delineated wetland areas, one on the south side of the canal just east of Klondyke Road and the other on the north side of the canal immediately west of Klondyke Road. Canal widening would also commence in this section. The modified alignment would shift the canal 50 feet or more north of its present course from Klondyke Road to the vicinity of Quarles Avenue, a street which terminates on the south side of the canal. Swinging into a more southwesterly track at this point, the improved canal would avoid another delineated wetland area on the northwest bank of the drainage basin. The 110-foot right-of-way width maintained heretofore would narrow to 100 feet, with the bottom width being reduced from 40 to 30 feet.

The modified canal would shift back to the southeast of its current alignment, before crossing Pineville Road, in order to avoid a small delineated wetland area on the northwest side of the drainage facility (see Figure No. 6, Appendix C). South of Pineville it would pass between the Tower Plaza property and a larger wetland area located on the southeastern side of the canal. It would also cross over to the north side of the Mississippi Power servitude. The 100-foot right-of-way with 30-foot bottom would be maintained

throughout this section. Roughly 4,500 feet downstream from the Pineville Road crossing, the canal would traverse a fingerlike extension of a delineated wetland area located on the southeast side of the canal, requiring the mitigation of approximately 500 square feet of wetland that would be incorporated into the widened drainage structure (see Figure No. 7, Appendix C).

The path of the proposed Canal No. 1 right-of-way begins to diverge from that of the Mississippi Power servitude just east of Beatline Road. The right-of-way would also narrow to 70 feet at the Beatline crossing and then to 60 feet another 650 feet downstream (see Figure No. 8, Appendix C). The 30 foot bottom width on the upstream side of Beatline will be maintained through the 70 foot right-of-way section on the downstream side, then reduced to 20 feet in the 60 foot-wide right-of-way section encompassing roughly the next 400 feet of the canal. In this narrower section of the canal, with its 60 to 70 foot right-of-way and 20 to 30 foot canal bottom width, stretching for 1,050 feet or so downstream from Beatline Road to just beyond the western city limits of Long Beach, the channel will be lined with rock riprap to prevent erosion and accommodate the significant increase in velocity attributable to the temporarily diminished capacity of the canal.

From the lined section to the end of the project at Espy Avenue, a distance of almost one mile, Canal No. 1 would be enlarged to maintain a 40 foot canal bottom within a 110-foot right-of-way. The alignment of the canal within this section would be largely unchanged, crossing the Mississippi Power servitude again and running along its southern edge for a short distance before the paths of the two utilities diverge in traversing the Long Beach Industrial Park.

### Permits and Compliances

The USACE has participated in the development of this Supplemental Environmental Impact Statement (SEIS) as a cooperating agency with the Natural Resources Conservation Service (NRCS) and Long Beach Water Management District (LBWMD). The original study determined that a Section 404 permit would be required for the proposed canal improvements based on two criteria: (1) total drainage area upstream of the proposed construction and (2) area affected at the normal high-water mark. The USACE has indicated it will use the SEIS as the NEPA document on which to base a decision regarding the issuance of a Section 404 or Section 10 permit. Section 10 of the Rivers and Harbors Act of 1899 requires that a permit be obtained from the Corps for certain structures or work in or affecting navigable waters of the United States prior to undertaking the work (33 U.S.C. 403). Section 404 of the Clean Water Act requires that a permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U. S., including wetlands, prior to undertaking the work (33 U.S.C. 1344). For regulatory purposes, the Corps of Engineers defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions.

Navigable waters of the U.S. are those waters subject to the ebb and flow of the tide shoreward to the mean high-water mark and/or other waters identified as navigable by the USACE. Land clearing operations involving vegetation removal with mechanized equipment such as front-end loaders, backhoes, or bulldozers with sheer blades, rakes, or discs; windrowing vegetation; land leveling; or other soil

disturbance in areas subject to Corps jurisdiction may be considered placement of dredged material under USACE jurisdiction. In order to determine the level of Corps jurisdiction, final wetland delineation for the project (including dredged material disposal sites) should be conducted in accordance with the Gulf Coastal Plain Regional Supplement to the 1987 Wetland Delineation Manual. Any work in waters of Canal No. 1 subject to the ebb and flow of the tide will require authorization under Section 10. It will also be necessary to comply with the requirements of 40 CFR Part 230 ("Section 404(b) (1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material"); 33 CFR Part 320.4 ("General Policies for Evaluating Permit Applications"); and 33 CFR part 332 ("Compensatory Mitigation for Losses of Aquatic Resources"). The Corps has indicated that the proposed Canal No. 1 project appears to be compatible with the USACE Mississippi Coast Improvements Program (MsCIP) project on Canal No. 2-3 which was scheduled to begin in the first quarter of 2009. (Improvements to the Long Beach canals are listed among the "Authorized Interim Projects" in Table 1-1 of the Corps's Mississippi Coastal Improvements Program (MsCIP) - Comprehensive Pion and Integrated Programmatic Environmental Impact Statement (USACE, 2009: 1-5).

It is recommended that the sponsors coordinate with the Mississippi Department of Marine Resources on Coastal Zone Management Plan consistency for Mississippi and determine if additional permits are required by the State for consistency other than Mississippi Marine Resources.

The sponsors will need to work with the local floodplain zoning authorities to determine building permit requirements. A No-Rise / No-Impact Certification may be required or a Conditional Letter of Map Revision CLOMR/LOMR if the regulatory floodway boundaries are encroached.

### Mitigation

Mitigation features included in the recommended plan incorporate avoidance and minimization of adverse impacts, as well as compensation for unavoidable losses of fish and wildlife habitat. Avoidance measures include re-alignment of the center line of some sections of the channel to avoid impacts to delineated wetlands.

Minimization measures include several sediment control features: construction of earth-lined channel sections with 3:1 side-slopes; vegetation of spoil berm and channel slopes after every 500 feet of construction; and installation of sediment traps at the downstream end of constructed channels. The sediment traps will provide storage for increased sediment yields during construction, as well as normal yields from the watershed. Traps consist of channel sections excavated an additional two feet for a distance of approximately 350 feet. Other minimization measures include selective snagging to be performed with hand-operated and other small equipment in a manner designed to minimize soil and water disturbance.

Compensatory activities include reforestation with hardwood species to offset clearing of pine and hardwoods. Compensation related to works of improvement on Canal No. 1 includes reforestation of approximately 61 acres temporarily cleared within the channel right-of-way. An additional 58 acres of reforestation will be located on suitable cleared land within the watershed. Suitable cleared land criteria

includes: ownership or easement of the land for the life of the project to insure protection and maintenance of the plantings, soil and hydrologic characteristics that are adequate for tree survival and growth. Tree plantings will consist of hardwood species, including at least four different kinds of oaks, and are to be planted in alternating rows on a 12-foot matrix spacing scheme.

The potential loss of approximately 0.01 acres of wetland as a result of improvements to Canal No. 1 will be mitigated separately and the specifics of that mitigation will be determined during the Section 404 permitting process. Two homes are shown to have increased depths of flooding as a result of installation of the recommended plan. Flood proofing or other types of damage mitigation will be provided for these properties during final design and installation of the project.

### Costs and Benefits

Information regarding the projected costs and benefits associated with the installation of improvements identified in the Long Beach Watershed Plan - Environmental Impact Statement may be found on pages 33-37 of said document and in tables 1-6 following on pages 38-45. The project has \$492,200 in average annual benefits associated with reduced flooding to the structures located along Canal No. 1, the average annual cost over the next 100 years is \$119,400. The total installation cost for improvements to both Canal No. 1 and Canal No. 2-3 was \$1,794,900. Nearly two-thirds of that total was attributed to improvements along Canal No. 1. The Canal No. 1 funding requirement of \$1,161,000 (in 1988 dollars) included costs for construction (\$814,500), engineering (\$129,900), project administration (\$57,100) and land rights (\$159,500). The construction cost included \$58,400 in mitigation-related expenses.

A preliminary cost estimate expressed in current (2014) dollars shows a total estimated construction cost for Canal No. 1 improvements of \$3,223,700. This total includes \$1,795,700 for actual construction, \$407,600 for engineering and permitting expenses and \$100,000 for remaining wetlands mitigation. It also includes \$930,400 for costs which may be incurred for the acquisition or use of land. These figures are preliminary and based on current unit prices for labor and materials. Actual costs will vary to one degree or another, depending on prevailing economic conditions when construction actually gets underway.

**Table 1 - Estimated Installation Cost**  
**Long Beach Watershed, Mississippi**  
(Dollars) <sup>1/</sup>

Installation Cost Item	Estimated Cost (Dollars)		Total
	PL-83-566 Funds	Other Funds	
Structural Measures			
Canal 1 Project Cost	\$2,297,300	\$936,400	\$3,233,700
<b>TOTAL PROJECT COST</b>	\$2,297,300	\$936,400	\$3,233,700

<sup>1/</sup> Price base 2014.

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**Table 2 - Estimated Cost Distribution - Structural Measures**  
**Long Beach Watershed, Mississippi**  
(Dollars) <sup>1/</sup>

Evaluation Unit	Public Law 83-566 Funds			Total PL-83-566	Other Funds				Total Other	Total Installation Costs
	Construction	Engineering	Admin.		Construction	Engineering	Landrights	Admin.		
Structural Measures										
Canal 1	\$1,895,700	\$360,200	\$41,400	\$2,297,300	\$0	\$0	\$930,400	\$6,000	\$936,400	\$3,233,700
<b>GRAND TOTAL</b>	\$1,895,700	\$360,200	\$41,400	\$2,297,300	\$0	\$0	\$930,400	\$6,000	\$936,400	\$3,233,700

<sup>1/</sup> Price base 2014.

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**TABLE 3B – STRUCTURAL DATA**  
Structural Data  
Long Beach Watershed, Mississippi

						Channel Dimensions				<i>n</i> value		Velocities (ft./sec)					
Channel Name	Station	Drainage Area (mi <sup>2</sup> )	100 Year Freq. Design Discharge (cfs)	Water surface Elevation Feet msl	Hydraulic Gradient (ft./ft.)	Gradient (ft./ft.)	Bottom Width	Elevation (ft. msl)	Side Slope	Aged	As Built	Aged <sup>1/</sup>	As Built <sup>2/</sup>	Excavation Volume (cu yds.)	Type of work <sup>3/</sup>	Existing Channel type 4/	Present Flow Condition <sup>5/</sup>
Canal No. 1	10+40														VIII	M	P
	46+27	0.92	1150	20.8			22	14.7	2.0						VI	M	P
	7/			20.8			22	11.7	2.0						VI	M	P
					0.00018	0.00036								13100			
	55+40	1.48	1120	20.7			40	11.4	3.0	0.030	0.025	1.83	1.58		II	M	P
	7/		240	20.7			A=1490	18.4	P=1250	0.100		0.16					
					0.11121	0.00046								6200			
	59+80	1.48	1400	20.6			43	11.2	2.0						II	M	P
				20.5			43	11.2	2.0						II	M	P
					0.00021	0.00101								1400			
	60+80	1.79	870	20.4			40	11.1	3.0	0.030	0.025	1.36	1.44		II	M	P
	7/		530	20.4			A=2400	16.8	P=1010	0.100		0.22					
					0.00006	0.00036								15400			
	71+80	1.79	1010	20.4			40	10.7	0.030	0.030	0.025	1.52	1.49		II	M	P
	7/		610	20.4			A=2170	16.8	P=1010	0.100		0.25					
					0.00008	0.00045											
	79+70	1.79	1030	20.3			30	10.3	3.0	0.030	0.025	1.78	1.74		II	M	P
	7/		710	20.3			A=2510	16.8	P=1010	0.100		0.28					
					0.00011	0.00043								20100			
	98+30	2.12	2100	20.1			24	9.5	2.0						II	M	P
				19.6			24	9.5	2.0						II	M	P
					0.00024	0.00104								1400			



**TABLE 3B – STRUCTURAL DATA CONTINUED**

Structural Data  
Long Beach Watershed, Mississippi

						Channel Dimensions				<i>n</i> value		Velocities (ft./sec)					
Channel Name	Station	Drainage Area (mi <sup>2</sup> )	100 Year Freq. Design Discharge (cfs)	Water Surface Elevation Feet msl	Hydraulic Gradient (ft./ft.)	Gradient (ft./ft.)	Bottom Width	Elevation (ft. msl)	Side Slope	Aged	As Built	Aged 1/	As Build 2/	Excavation Volume (cu yds.)	Type of Work 3/	Existing Channel Type 4/	Present Flow Condition 5/
Canal No. 1	99+55	2.12	1760	19.6			30	9.4	3.0	0.030	0.025	2.85	2.51		II	M	P
	7/		490	19.6			A=1490	16.5	P=930	0.100		0.34					
					0.00027	0.00042								40500			
	132+70	2.85	1180	18.7			60	8	3.0	0.030	0.025	1.69	2.23		II	M	P
	7/		1020	18.7			A=3660	14.4	P=1770	0.100		0.28					
					0.00009	0.00045								54600			
	165+85	3.67	2090	18.4			30	6.5	3.0	0.030	0.025	2.56	2.68		II	M	P
	7/		600	18.4			A=1550	13.4	P=520	0.100		0.38					
					0.00018	0.00041								54400			
	194+50	4.10	2900	17.9			23	5.3	2.0						VII	M	P
				17.7	0.00033	0.00033	23	5.3	2.0					600	VII	M	P
	194+80	4.10	2760	17.7			30	5.3	2.0	0.035	0.035	4.06	4.06		VIII	M	P
	7/		520	17.7			A=2360	14.5	P=1220	0.100		0.22					
					0.00058	0.00058								7900			
	200+00	4.10	2330	17.4			20	5	1.50	0.030	0.030	4.86	4.86		VII	M	P
	7/		810	17.4			A=2790	14.5	P=1220	0.100		0.29					
					0.00067	0.00033								3100			
	203+00	4.10	2400	17.2			20	4.9	1.50	0.035	0.035	5.08	5.08		VII	M	P
	7/		840	17.2			A=2360	14.5	P=1220	0.100		0.36					
					0.00100	0.00040								1900			
	204+00	4.10	2680	17.1			40	4.9	3.00	0.030	0.025	2.85	2.7		II	M	P
	7/		250	17.1			A=1020	14.5	P=710	0.100		0.25			II	M	P
					0.00021	0.00048								25700			
	213+65	4.36	3310	16.9			40	4.4	3.00	0.030	0.025	3.45	2.53		II	M	P

**TABLE 3B – STRUCTURAL DATA CONTINUED**

Structural Data  
Long Beach Watershed, Mississippi

						Channel Dimensions				<i>n</i> value		Velocities (ft./sec)					
Channel Name	Station	Drainage Area (mi <sup>2</sup> )	100 Year Freq. Design Discharge (cfs)	Water Surface Elevation Feet msl	Hydraulic Gradient (ft./ft.)	Gradient (ft./ft.)	Bottom Width	Elevation (ft. msl)	Side Slope	Aged	As Built	Aged 1/	As Built 2/	Excavation Volume (cu yds.)	Type of Work 3/	Existing Channel type 4/	Present Flow Condition 5/
Canal No. 1	7/		380	19.6			A=1250	12.8	P=710	0.100		0.31					
					0.00030	0.00044								81500			
	255+50	5.42	2340	15.7			40	2.6	3.00	0.030	0.025	2.23	1.13		II	M	P
	7/		1370	15.7			A=4380	11.7	P=1650	0.100		0.31					
					0.00012	0.00012								1200			
	257+20	5.42	3700	15.6			14	2.5	2.50								

<sup>1/</sup> Aged Velocities are based on design discharges.

<sup>2/</sup> As-Built Velocities are based on bankfull discharge or the 10-year frequency discharge, whichever is smaller.

<sup>3/</sup> I-Establishment of new channel including necessary stabilization measures. II- Enlargement or realignment of existing channel or stream. III-Cleaning out natural or manmade channel (includes bar removal and major clearing and snagging operation.) IV-Clearing and Snagging. V-Stabilization as primary purpose (by continuous treatment or localized problem areas present capacity adequate). VI-Grade Control Structure. VII-Rock riprap lined channel area. VIII-Selective snagging.

<sup>4/</sup> N-Unmodified, well defined natural channel or stream. M-Manmade ditch or previously modified channel. O-None or practically no defined channel.

<sup>5/</sup> P-Perennial – Flows at all times except during extreme drought.

I-Intermittent – Continuous flow through some seasons of the year, but little or no flow through other seasons.

E-Ephemeral- Flows only during periods of surface runoff, otherwise dry.

S- Ponded water with no noticeable flow – caused by lack of outlet or high ground water.

<sup>6/</sup> Road section with headwater and tailwater conditions shown on separate lines.

<sup>7/</sup> This line represents the out-of-bank flow segment at this station.

**Table 4 - Estimated Average Annual NED Costs**  
**Long Beach Watershed, Mississippi**  
(Dollars) <sup>1/</sup>

Evaluation Unit	Amortized Installation	O&M & Replacement	Total
Rehabilitation			
Canal 1	\$109,000	\$10,400	\$119,400
<b>GRAND TOTAL</b>	<b>\$109,000</b>	<b>\$10,400</b>	<b>\$119,400</b>

<sup>1/</sup> Discount rate is 3.375% with a 104 year period of analysis. Price base 2014.

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**Table 5 - Estimated Average Annual Flood Damage Reduction Benefits**  
**Long Beach Watershed, Mississippi**  
(Dollars) <sup>1/</sup>

Canal 1	Average Annual Damages Without Project		Average Annual Damages With Project		Average Annual Benefits	
Item	Ag Related	Non-Ag Related	Ag Related	Non-Ag Related	Ag. Related <sup>1/</sup>	Non-Ag Related
<b>Floodwater Damage</b>						
Urban	-	\$1,069,300	-	\$641,300	-	\$428,000
<b>Subtotal</b>	<b>-</b>	<b>\$1,069,300</b>	<b>-</b>	<b>\$641,300</b>	<b>-</b>	<b>\$428,000</b>
Indirect Damage <sup>2/</sup>	-	160,400	-	\$96,200	-	\$64,200
<b>GRAND TOTAL</b>	<b>-</b>	<b>\$1,229,700</b>	<b>-</b>	<b>\$96,200</b>	<b>-</b>	<b>\$492,200</b>

<sup>1/</sup> Discount rate is 3.375% with a 104 year period of analysis. Price base 2014.

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<sup>2/</sup> Indirect benefits were calculated as 25% for road and bridge benefits, 15% for Urban and 10% for all other benefits in table, as shown in Economics Guide, Page 32, dated 1964.

**Table 6 - Comparison of NED Benefits and Costs**  
**Long Beach Watershed, Mississippi**  
(Dollars) <sup>1/</sup>

Evaluation Unit	Average Annual Benefits					Average Annual Cost <sup>4/</sup>	Benefit-Cost Ratio
	Damage Reduction <sup>2/</sup>		Other <sup>3/</sup>		Total		
	Agricultural	Non-Agricultural	Agricultural	Non-Agricultural			
Canal 1					\$492,200	\$119,400	4.1:1.0
TOTAL		\$492,200			\$492,200	\$119,400	4.1:1.0

<sup>1/</sup> Discount rate is 3.375% with a 104 year period of analysis; all values are updated to 2014.

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<sup>2/</sup> From table 5.

<sup>4/</sup> From table 4.

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Table D - List of PreparersNRCS<sup>1/</sup>

Name	Current Position-years	Education	Experience-years
Billy R. Porter	Assistant State Conservationist, Water Resources – 15	B.S. Agricultural Economics	Economist – 14 Soil Conservationist-4
Gary W. Utley	Hydraulic Engineer-30	B.S. Agricultural Engineering	Resource Engineer-2
Steven P. Elsener	Biologist-36	B.S. Wildlife Ecology	Soil Conservationist-3
Richard L. Lane	Planning Engineer-23	B.S. Agricultural Engineering	Project Engineer-2 Area Engineer-7
K.C. Kraft	Archaeologist –13	B.A. Anthropology M.A. Anthropology PhD Anthropology	Archaeologist-23
April Burns	Water Resources Planning Coordinator-10	B.S. Ag Economics	Ag Economist – 6

<sup>1/</sup>The draft watershed plan and environmental impact statement was reviewed and concurred with by State staff specialists having responsibility for engineering, soils, agronomy, range conservation, biology, cultural resources, forestry, and geology. This review was followed by review of the document by the NWMC.

## Other Individuals

Name	Current Position-years	Education	Experience-years
Neel-Schaffer, Inc.			
Barry Brupbacher	Senior Project Manager-6	M.S. Urban Studies	Sr PM-6, Transport/Env Planner-30
David Ruhl	Senior Project Manager-6	B.S. Civil Engineering – B.S. Geology	Sr PM-5, Project Engineer-22
Robert Walker	Senior Vice President-6	B.S. Civil Engineering	Sr VP-6, VP-5, SrPM-5, PM-7
James Wilkinson	Planning 111–8	M.U.R.P	Plan 111-8, Sr Trans Plan-13, Trans Plan-12
Alane Young	Geologist 111-5	B.S. Geology, M.S. Geology	Project Geologist-26
Scott Holland	Project Manager	B.S. Civil Engineering	
William E. Knesal, Jr., P.E.	President-19	B.S. Civil Engineering	
Erin Netterville	Biologist	N/A	
Steve Smith	Biologist	N/A	
Earth Search, Inc.			
Rhonda Smith	Senior Project Manager-16	M.A. Anthropology	Archaeologist-22
Jill-Karen Yakubik	Principal Investigator-26	PhD, Anthropology	Archeologist-32

## **Distribution List**

Tunica-Biloxi Indians of Louisiana, Inc.  
U.S. Army Corps of Engineers – Mobile District  
U.S. Department of Agriculture- Mississippi Farm Service Agency  
U.S. Department of Agriculture – Forest Service  
U.S. Department of Agriculture – Natural Resources Conservation Service  
U.S. Environmental Protection Agency  
U.S. Fish and Wildlife Service  
National Marine Fisheries Service  
Mississippi Department of Marine Resources  
Mississippi Department of Environmental Quality  
Mississippi Department of Archives and History  
State of Mississippi – Office of Governor  
Mississippi State Director of Rural Development  
Mississippi Department of Wildlife, Fisheries and Parks – Natural Heritage Program  
Mississippi Forestry Commission  
Mississippi Soil and Water Conservation Commission  
Mississippi Department of Transportation  
Southwest Mississippi Planning and Development District  
Gulf Regional Planning Commission  
Gulf Restoration Network



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## **Appendix A: Comments and Responses**



United States Department of Agriculture

May 14, 2015

Kyle Swanier, Conservation Biologist  
Mississippi Natural Heritage Program  
Mississippi Department of Wildlife, Fisheries, and Parks  
2148 Riverside Drive, Jackson Mississippi 39202

Dear Mr. Swanier,

In response to your letter dated March 11, 2015, regarding the Draft Supplemental Environmental Impact Statement for the Long Beach Watershed, the Natural Resources Conservation Service would like to thank you for reviewing the draft SEIS.

NRCS agrees with your recommendations concerning implementation of best management practices, wetland disturbance and erosion prevention. Monitoring during project implementation will be performed to assure compliance. If unforeseen impacts to designated wetlands occur, mitigation will be provided.

Respectfully,

A handwritten signature in blue ink, appearing to read "K. Readus", written over a horizontal line.

Kurt Readus  
State Conservationist

Natural Resources Conservation Service  
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Jackson, MS 39269  
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

April 20, 2015

Kurt Readus  
State Conservationist USDA  
Natural Resources Conservation Service  
100 W. Capitol Street, Suite 1321  
Jackson, Mississippi 39269

**DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT  
(DSEIS) For the LONG BEACH WATERSHED  
CEQ Number: 20150049**

Dear Mr. Readus:

The U.S. Environmental Protection Agency (EPA) has reviewed the referenced Draft Supplemental Environmental Impact Statement (DSEIS) for the Long Beach Watershed in accordance with its responsibilities under Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act.

**Background:** The Long Beach Watershed DSEIS is a supplement to the original environmental impact statement (1989) that includes updated information for the channel modification of Canal 1. The DSEIS also includes a supplemental watershed agreement No. 2. According to NRCS, the project sponsors are updating the Environmental Impact Statement in order to identify the impacts of modifying the channel to reduce flooding to urban areas which include 121 residences and businesses along the canal. The proposed modifications include 3.8 miles of widening, side-sloping and grading of the earth-lined channel, and 0.2 miles of rock riprap lined channel. The Long Beach Watershed shares a common border with the Turkey Creek Watershed.

**EPA Comments and Recommendations:**

**Floodplain:**

- **Comment:** EPA is concerned that decreasing the size of the floodplain as defined by FEMA flood plains and flood insurance and FIS maps invites encroachment of development which will only exacerbate existing flooding issues.

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**Recommendation:** Preserving undeveloped areas along the canal and allowing those areas to flood, similar to the approach that is being taken in Turkey Creek, provides a step toward a more long-term solution.

- **Comment:** The DSEIS proposes increasing the capacity of the canals which will decrease the floodplain by 150 ft, 450 ft, and 400 ft for the 100-year, 10-year, and 1-year flood events respectively. The flow velocity will also increase by 0.3 ft/s, 0.5 ft/s, and 0.6 ft/s for the 100-year, 10-year, and 1-year flood events respectively. According to the DSEIS, FEMA floodplain maps and the Flood insurance maps will be modified after the channel improvements are complete.

**Recommendation:** EPA believes that this action may result in more development around the canal in the future. Should this occur, then larger canals may be needed in the future. A more sustainable solution to address future watershed issues should be considered similar to what is being considered in Turkey Creek.

- **Comment:** The Long Beach Watershed shares a common boundary with the Turkey Creek Watershed. According to information in the DSEIS, during time of peak flows, the vast majority of any overflow from Turkey Creek will be transported downstream by Canal #2-3, and some of the Turkey Creek floodwater breaks over the watershed boundary along 28<sup>th</sup> Street and flows into the Long Beach Watershed. By letter dated 1/2/09, EPA requested that the DSEIS include an analysis of how the proposed project could (or will) serve as a diversion canal for any adjacent streams. EPA particularly stated the analysis should investigate impacts to the drainage conditions within the Turkey Creek basin. The DSEIS discusses the effects of the Turkey Creek overflow on Canal #1 and Canal #2-3, but it does not appear to specifically discuss the impacts of the project to the drainage conditions within the Turkey Creek basin.

**Recommendation:** EPA would like to reiterate its previous request for an analysis of the impacts of the proposed project to the drainage conditions within the Turkey Creek basin. EPA requests that the Final SEIS indicate how much overflow from Turkey Creek is entering the Long Beach Watershed, and whether the improvements of Canal #1 will in turn affect the drainage of Turkey Creek (e.g., increase the quantity of overflow from Turkey Creek).

- **Comment:** According to the DSEIS, the survey conducted identified 2.72 acres of palustrine wetlands, 2.89 acres of lacustrine wetlands, and 5.26 miles of jurisdictional waters within the project area. The only permanent impact would be 0.01 acres of palustrine wetland that would be lost to the channel widening. The project will involve clearing a total of 61 acres which would be considered temporary since they will be replanting the 61 acres and an additional 58 acres after the project is completed. Revegetation may be affected due to anaerobic soil conditions and any newly planted trees may take a while to grow back.

**Recommendation:** EPA notes that although there are only 0.01 acres of permanent impacts, there are substantial impacts to the riparian area which may include clearing of wetlands. Clearing should be minimized as much as possible both for surface roughness and bank stabilization. Also, efforts to mitigate/address some of the temporal loss should be considered.

- **Turkey Creek Overflow:** According to the DSEIS, Canal No. 1 and Canal No. 2-3 are hydraulically connected and share a common 100-year floodplain within this reach. Downstream of this common floodplain the two canals separate. The Canal No. 1 stream reach is largely located within the U.S. Naval Reservation at Gulfport. During time of peak flows, some of the Turkey Creek floodwater crosses over the watershed boundary along 28<sup>th</sup> Street and flows into the Long Beach Watershed. The effect of Turkey Creek overflow on Canal #1 is a concern to the Long Beach residents downstream. The quantity and timing of any overflow from Turkey Creek down Canal No. 1 will affect both the existing function of the channel as well as the design of the modified channel. To reduce flooding to residents and businesses along Canal #1, the NRCS is proposing to modify the channel to carry a larger capacity of runoff.

**Comment:** EPA notes that the improvements to Canal 2 in Turkey Creek have been implemented. However, it is unclear what impact these improvements have had on potential overflows to Long Beach Residents. The Final SEIS should include this information.

#### **Impacts of Overflows**

- The DSEIS States that the channel modifications is designed to reduce flooding to 121 residences and business along the canal by modifying the channel to carry a larger capacity of runoff. The DSEIS indicates that the channel improvements would result in a decrease in storm elevations by 0.9 ft, 1.0 ft, and 1.3 ft for the 100-year, 10-year, and 1-year flood events respectively. However, downstream from the channel improvements, storm elevations will increase by 0.35 ft for the 25-yr to 100-yr storm and 0.57 ft for the 1-yr to 10-yr storm. Velocity would also increase by 0.19 ft/s for the 1-yr to 10-yr storm. As a result, two residential homes will experience increased flooding. Currently the homes are not inundated by the 100-yr storm but after the channel improvements are completed, these homes will be inundated by 0.13 ft to 0.61 ft of water. The homes currently flood during the 500-yr event but after the project is completed, flooding would increase by 0.19 ft.

**Recommendation:** The DSEIS notes the potential residential impacts, but does not discuss efforts to compensate or offset impacts to these residents.

According to the DSEIS, improvements to Canal 2-3 that were completed in 2012 have provided reduced flooding to structures with no known negative impacts to the surrounding environment.

**Comment:** The Final SEIS should provide information or data that supports the reduction in flooding to structures and the lack of adverse impacts to the environment. This information would be helpful because local residents and others remain concerned about potential flooding in their communities and it may further support the benefits of the proposed modification.

- **Compensatory Mitigation Comment:** Compensation for impacts to fish and wildlife habitat include planting an additional 58 acres of trees on suitable cleared land within the watershed. However, there is no description of what is considered suitability.

**Recommendation:** It is recommended that the Final SEIS describe or explain what is considered “suitable cleared land” as it relates to the compensatory mitigation activity (for example, is it based on certain zoning requirements/restrictions, proximity to Canal #1, etc.). It is also recommended that the Final SEIS indicate the estimated amount of “suitable cleared land” currently available in the watershed.

**Other Comments or Clarifications:**

**Comment:** In order to minimize the effects of increased turbidity levels, sediment decreasing construction techniques will be implemented, including: (a) sediment traps at the lower end of the channel; (b) channel side slopes constructed at 3:1; and (c) vegetation of spoil, berm, and channel slopes. However, the DSEIS contains discrepancies regarding the distance that spoil berm and channel slopes will be vegetated. Some pages of the DSEIS (e.g., Pages 21 and 31) state that spoil berm and channel slopes will be vegetated every 1,000 feet of construction, but other pages (e.g., Pages 3, 23, and 33) state that spoil berm and channel slopes will be vegetated every 500 feet of construction.

**Recommendation:** This Final EIS should correct this discrepancy.

- **Comment:** Page 31 of the DSEIS explains that the centerline of some sections of the channel will be realigned in order to avoid impacts to some delineated wetlands. However, this avoidance measure is not included in the “Mitigation” section on Page 33.

**Recommendation:** Since mitigation features included in the recommended plan incorporate avoidance and minimization of adverse impacts, as well as compensation for unavoidable losses of fish and wildlife habitat, it would be appropriate to also have the avoidance measure identified under the “Mitigation” section, Page 33. For the convenience of the reader, it is recommended that the realignment of the centerline of sections of the channel be identified in the “Mitigation” section (Page 33) as an avoidance measure.

- **Comments:** Some of the Survey data or correspondence appear to be 5-7 years old. (i.e., Cultural Resource Surveys, Fish and Wildlife Survey). Is the information still up-to-date and do the agencies still support the previous findings?

Thank you for the opportunity to review this DSEIS. We rate this document EC-1 Environmental Concerns; We have concerns that the proposed action identifies the potential for impacts to the environment that should be further avoided/minimized and addressed in the Final SEIS. We also strongly agree with the need for a robust monitoring and evaluation program to determine the potential for any adverse impacts from the project.

Please contact Ken Clark of my staff at (404) 562- 8282 if you have any questions or want to discuss our comments further.

Sincerely,

A handwritten signature in black ink, appearing to read "Heinz J. Mueller", with a stylized flourish at the end.

Heinz J. Mueller, Chief  
NEPA Program Office





United States Department of Agriculture

May 14, 2015

Heinz J. Mueller, Chief  
NEPA Program Office  
U.S. Environmental Protection Agency, Region 4  
Atlanta Federal Center  
61 Forsyth Street  
Atlanta, Georgia 30303-8960

Dear Mr. Mueller

In response to your letter dated April 20, 2015, regarding the Draft Supplemental Environmental Impact Statement for the Long Beach Watershed, the Natural Resources Conservation Service would like to thank you for reviewing the draft SEIS.

NRCS has provided responses to your comments and recommendations below:

**Floodplain:**

**Comment 1:** EPA is concerned that decreasing the size of the floodplain as defined by FEMA flood plains and flood insurance and FIS maps invites encroachment of development which will only exacerbate existing flooding issues.

**Recommendation:** Preserving undeveloped areas along the canal and allowing those areas to flood, similar to the approach that is being taken in Turkey Creek, provides a step toward a more long-term solution.

**Comment 2:** The DSEIS proposes increasing the capacity of the canals, which will decrease the floodplain by 150 ft., 450 ft., and 400 ft. for the 100-year, 10-year, and 1-year flood events respectively. The flow velocity will also increase by 0.3 ft./s, 0.5 ft./s, and 0.6 ft./s for the 100-year, 10-year, and 1-year flood events respectively. According to the DSEIS, FEMA floodplain maps and the flood insurance maps will be modified after the channel improvements are complete.

**Recommendation:** EPA believes that this action may result in more development around the canal in the future. Should this occur, then larger canals may be needed in the future. A more sustainable solution to address future watershed issues should be considered similar to what is being considered in Turkey Creek.

**NRCS Response Comment 1 & 2:** NRCS agrees that the enlargement of Canal-1 will reduce the existing floodplain and could result in more development around the canal in the future. This expectation of increased runoff was considered and included in the

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future with project condition analysis. However, the NRCS certainly has no objection to leaving the reduced floodplain area undeveloped to help minimize flooding. The following paragraph was added to the SEIS on Page 20 recommending that this be considered.

The potential enlargement of Canal-1 will reduce the existing floodplain and could result in more development around the canal in the future. This expectation of increased runoff was considered and included in the future with project condition analysis. It has been suggested that this reduced floodplain be preserved as an undeveloped area in order to reduce potential runoff. The NRCS certainly has no objection to leaving the reduced floodplain area undeveloped to help minimize future flooding. In this case, the existing floodplain maps could be used as is. In any case, the existing floodplain regulations should be strictly enforced to minimize encroachment and reduce the runoff potential.

**Comment 3:** The Long Beach Watershed shares a common boundary with the Turkey Creek Watershed. According to information in the DSEIS, during time of peak flows, the vast majority of any overflow from Turkey Creek will be transported downstream by Canal #2-3, and some of the Turkey Creek floodwater breaks over the watershed boundary along 28th Street and flows into the Long Beach Watershed. By letter dated 1/2/09, EPA requested that the DSEIS include an analysis of how the proposed project could (or will) serve as a diversion canal for any adjacent streams. EPA particularly stated the analysis should investigate impacts to the drainage conditions within the Turkey Creek basin. The DSEIS discusses the effects of the Turkey Creek overflow on Canal #1 and Canal #2-3, but it does not appear to specifically discuss the impacts of the project to the drainage conditions within the Turkey Creek basin.

**Recommendation:** EPA would like to reiterate its previous request for an analysis of the impacts of the proposed project to the drainage conditions within the Turkey Creek basin. EPA requests that the Final SEIS indicate how much overflow from Turkey Creek is entering the Long Beach Watershed, and whether the improvements of Canal #1 will in turn affect the drainage of Turkey Creek (e.g., increase the quantity of overflow from Turkey Creek).

**NRCS Response Comment 3:** The improved channel is located far enough downstream that there is no change in the backwater effect from Canal-1 at the area that Turkey Creek overflow occurs near 28th Street. This means that there is no change in overflow from Turkey Creek to the Long Beach Watershed expected for any given storm. The implementation of Canal-1 will not affect the quantity or timing of overflow from Turkey Creek for any given storm. Also, the implementation of Canal-1 will not affect the quantity or timing of flow down the Turkey Creek Watershed for any given storm. The following paragraph was added to the SEIS on Page 14 to address this comment.

Additional questions have been raised on how the planned improvement to Canal-1 will affect the quantity and timing of overflow from Turkey Creek as well as the remaining flow down Turkey Creek. The improved channel is located far enough downstream that there is no change in the backwater effect from Canal-1 at the area that the Turkey Creek overflow occurs near 28th Street. This means that there is no change in overflow from Turkey Creek to the Long Beach Watershed expected for any given storm. The implementation of Canal-1 will not affect the quantity or timing of overflow from Turkey Creek for any given storm. Also, the

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implementation of Canal-1 will not affect the quantity or timing of flow down the Turkey Creek Watershed for any given storm.

**Comment 4:** According to the DSEIS, the survey conducted identified 2.72 acres of palustrine wetlands, 2.89 acres of lacustrine wetlands, and 5.26 miles of jurisdictional waters within the project area. The only permanent impact would be 0.01 acres of palustrine wetland that would be lost to the channel widening. The project will involve clearing a total of 61 acres which would be considered temporary since they will be replanting the 61 acres and an additional 58 acres after the project is completed. Re-vegetation may be affected due to anaerobic soil conditions and any newly planted trees may take a while to grow back.

**Recommendation:** EPA notes that although there are only 0.01 acres of permanent impacts, there are substantial impacts to the riparian area which may include clearing wetlands. Clearing should be minimized as much as possible both for surface roughness and bank stabilization. Also, efforts to mitigate/address some of the temporal loss should be considered.

**NRCS Response Comment 4:** NRCS agrees with the recommendation to minimize clearing of the riparian area and all efforts will be made to minimize temporal losses.

**Turkey Creek Overflow:** According to the DSEIS, Canal No. 1 and Canal No. 2-3 are hydraulically connected and share a common 100-year floodplain within this reach. Downstream of this common floodplain the two canals separate. The Canal No. 1 stream reach is largely located within the U. S. Navel Reservation at Gulfport. During time of peak flows, some of the Turkey Creek floodwater crosses over the watershed boundary along 28<sup>th</sup> Street and flows into the Long Beach Watershed. The effect of Turkey Creek overflow on Canal No. 1 is a concern to the Long Beach residents downstream. The quantity and timing of any overflow from Turkey Creek down Canal No. 1 will affect both the existing function of the channel as well as the design of the modified channel. To reduce flooding to residents and businesses along Canal No. 1, the NRCS is proposing to modify the channel to carry a larger capacity of runoff.

**Comment 5:** EPA notes that the improvements to Canal 2 in Turkey Creek have been implemented. However, it is unclear what impact these improvements have had on potential overflows to Long Beach Residents. The Final SEIS should include this information.

**NRCS Response Comment 5:** Detailed analysis of the environmental impacts of the implemented Canal 2-3 in the Long Beach Watershed were not considered to be part of the current SEIS and were not conducted. Any detailed analysis of Canal 2-3 was limited to what directly effects Canal-1 such as the division of the Turkey Creek overflow. Observations of what worked well and/or what didn't work as expected have been ongoing since the implementation of Canal 2-3. These lessons learned during and since the implementation of Canal 2-3 will certainly be considered in the final design phase of Canal-1.

#### Impacts of Overflows

The DSEIS States that the channel modification is designed to reduce flooding to 121 residences and business along the canal by modifying the channel to carry a larger capacity of runoff. The DSEIS indicates that the channel improvements would result in a decrease in storm elevations by 0.9 ft., 1.0 ft., and 1.3 ft. for the 100-year, 10-year, and 1-year flood events respectively. However, downstream from the channel improvements, storm elevations will increase by 0.35 ft. for the 25-year to 100-year storm and 0.57 ft. for the 1-year to 10-year storm. Velocity would also increase by 0.19 ft./s for the 1-year to 10-year storm. A result, two

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residential homes will experience increased flooding. Currently the homes are not inundated by the 100-year storm but after the channel improvements are completed, these homes will be inundated by 0.13 ft. to 0.61 ft. of water. The homes currently flood during the 500-year event but after the project is completed, flooding would increase by 0.19 ft.

**Recommendation:** The DSEIS notes the potential residential impacts, but does not discuss efforts to compensate or offset impacts to the residents. According to the DSEIS, improvements to Canal 2-3 that were completed in 2012 have provided reduced flooding to structures with no known negative impacts to the surrounding environment.

**Comment 6:** The Final SEIS should provide information or data that supports the reduction in flooding to structures and the lack of adverse impacts to the environment. This information would be helpful because local residents and others remain concerned about potential flooding in their communities and it may further support the benefits of the proposed modifications.

**NRCS Response Comment 6:** Page 34 of the document indicates that flood proofing or other types of damage mitigation will be provided for the two properties with increased flooding. Detailed analysis of the environmental impacts of the implemented Canal 2-3 were not considered to be part of the current SEIS and were not conducted. Any detailed analysis of Canal 2-3 was limited to what directly effects Canal-1 such as the division of the Turkey Creek overflow. Observations of what worked well and/or what didn't work as expected have been ongoing since the implementation of Canal 2-3. These lessons learned during and since the implementation of Canal 2-3 will certainly be considered in the final design phase of Canal-1.

**Comment 7 Compensatory Mitigation:** Compensation for impacts to fish and wildlife habitat include planting an additional 58 acres of trees on suitable cleared land within the watershed. However, there is no description of what is considered suitability.

**Recommendation:** It is recommended that the Final SEIS describe or explain what is "suitable cleared land" as it relates to the compensatory mitigation activity (for example, is it based on certain zoning requirements/restrictions proximity to Canal No. 1 etc.) It is also recommended that the Final SEIS indicate the estimated amount of "suitable cleared land" currently available in the watershed.

**NRCS Response Comment 7:** NRCS agrees with the comment and "suitable cleared land" will be described in the final plan.

**Other Comments or Clarifications Comment 8:** In order to minimize the effects of increased turbidity levels, sediment decreasing construction techniques will be implemented, including: (a) sediment traps at the lower end of the channel; (b) channel side slopes constructed at 3:1; and (c) vegetation of spoil, berm, and channel slopes. However, the DSEIS contains discrepancies regarding the distance that spoil berm and channel slopes will be vegetated.

**Recommendation:** This Final EIS should correct this discrepancy.

**NRCS Response Comment 8:** NRCS agrees discrepancies will be corrected, all distances will be changed to every 500 ft.

Natural Resources Conservation Service  
100 W. Capitol Street, Suite 1321  
Jackson, MS 39269  
Voice (601) 965-5205  
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United States Department of Agriculture

**Comment 9:** Page 31 of the DSEIS explains that the centerline of some sections of the channel will be realigned in order to avoid impacts to some delineated wetlands. However, this avoidance measure is not included in the "Mitigation" section on Page 33.

**NRCS Response Comment 9:** NRCS agrees, changes to text will be made to add avoidance measures to Mitigation section on page 33.

**Comment 10:** Some of the Survey data or correspondence appear to be 5-7 years old. (i.e., Cultural Resources Surveys, Fish and Wildlife Survey). Is the information still up-to-date and do the agencies still support the previous findings?

**NRCS Response Comment 10:** Yes, information is still up-to-date. Commenting agencies still support previous findings.

Respectfully,

A handwritten signature in blue ink, appearing to read "K. Readus", written over a horizontal line.

Kurt Readus  
State Conservationist

Natural Resources Conservation Service  
100 W. Capitol Street, Suite 1321  
Jackson, MS 39269  
Voice (601) 965-5205  
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United States Department of Agriculture

May 14, 2015

Willa J. Brantley  
Bureau Director, Wetlands Permitting  
Mississippi Department of Marine Resources  
1141 Bayview Avenue  
Biloxi, MS 39530

Dear Ms. Brantley,

In response to your letter dated March 27, 2015, regarding the Draft Supplemental Environmental Impact Statement for the Long Beach Watershed, the Natural Resources Conservation Service would like to thank you for reviewing the draft SEIS.

The Joint Application Form and Notification form will be completed after final design prior to any construction. The wetland delineation report has been reviewed and is considered current by our Area Biologist for that area.

Respectfully,

A handwritten signature in blue ink, appearing to read "K. Readus", written over a horizontal line.

Kurt Readus  
State Conservationist

Natural Resources Conservation Service  
100 W. Capitol Street, Suite 1321  
Jackson, MS 39269  
Voice (601) 965-5205  
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**MISSISSIPPI  
DEPARTMENT OF MARINE RESOURCES**

March 27, 2015

United States Department of Agriculture  
Natural Resources Conservation Service  
Attn: Kurt Readus  
100 W. Capitol Street, Suite 1321  
Jackson, MS 39269

RE: DMR-090274; SAM-2009-01918-JBM; USDA; Supplemental EIS, City of Long Beach  
Watershed Improvements

Dear Mr. Readus:

The Department of Marine Resources in cooperation with other state agencies is responsible under the Mississippi Coastal Program (MCP) for managing the coastal resources of Mississippi. Proposed activities in the coastal area are reviewed to insure that the activities are in compliance with the MCP.

The Department has received a request to review the draft Supplemental Environmental Impact Statement (EIS) for the Long Beach Watershed, Mississippi. Please note the comments made in response to the previous review on December 18, 2008 (enclosed). In addition, it is recommended that an updated wetland delineation be submitted with the Joint Application and Notification form. Thank you for the opportunity to comment on your project.

For more information, questions concerning this correspondence, or to obtain an application packet, contact Greg Christodoulou with the Bureau of Wetlands Permitting at (228) 523-4109 or [greg.christodoulou@dmr.ms.gov](mailto:greg.christodoulou@dmr.ms.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Willa J. Brantley".

Willa J. Brantley  
Bureau Director, Wetlands Permitting

WJB/gsc

Enclosure

Cc: MS Coastal Team, USACE Regulatory Division, Mobile District

1141 Bayview Avenue • Biloxi, MS 39530 • (228) 374-5000



**MISSISSIPPI  
DEPARTMENT OF WILDLIFE, FISHERIES, AND PARKS**

Sam Polles, Ph.D.  
Executive Director

March 11, 2015

**U.S. Department of Agriculture  
100 W. Capitol Street, Suite 1321  
Jackson, MS 39269**

Re: Supplemental Environmental Impact Statement  
**Long Beach Watershed**  
Harrison County, Mississippi

**R# 10750**

To Mr. Kurt Readus:

In response to your request for information dated February 9, 2015, we have searched our database for occurrences of state or federally listed species and species of special concern that occur within 2 miles of the site of the proposed project. Please find our concerns and recommendations below.

The following species of concern may occur within 2 miles of the proposed project area:

SCIENTIFIC NAME	COMMON NAME	FED	STATE	STATE RANK
<i>Charadrius alexandrinus tenuirostris</i>	Southeastern Snowy Plover		LE	S2
<i>Charadrius melodus</i>	Piping Plover	LE, LT	LE	S2N
<i>Erythrodiplax umbrata</i>	Band Winged Dragonlet			S1
<i>Lilaeopsis carolinensis</i>	Carolina Lilaeopsis			S2S3
<i>Macrodiplax balteata</i>	Marl Pennant			S2
<i>Sternula antillarum</i>	Least Tern	PS:LE		S3B

State Rank

S1 — Critically imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.

S2 — Imperiled in Mississippi because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.

S3 — Rare or uncommon in Mississippi (on the order of 21 to 100 occurrences).



State and Federal Status

LE Endangered — A species which is in danger of extinction throughout all or a significant portion of its range.

LT Threatened — A species likely to become endangered in foreseeable future throughout all or a significant portion of its range.

**Based on information provided, we conclude that if best management practices are properly implemented, monitored, and maintained (particularly measures to prevent, or at least, minimize negative impacts to water quality), the proposed project likely poses no threat to listed species or their habitats.**

**Recommendations:**

We recommend that best management practices be properly implemented, monitored, and maintained for compliance, specifically measures that will prevent suspended silt and contaminants from leaving the site in stormwater run-off as this may negatively affect water quality and habitat conditions within nearby streams and waterbodies.

In addition, portions of this project site are underlain by hydric soils and may be designated wetlands. If this project is approved, we ask that serious consideration be given to the cumulative impacts of wetland disturbance and elimination, and that appropriate in-kind mitigation be provided.

We recommend that areas up and downstream of the project area be monitored for increased erosion due to proposed channel alterations. Any additional erosion due to the proposed project should be addressed to prevent increased turbidity in receiving waters.

Please feel free to contact us if we can provide any additional information, resources, or assistance that will help minimize negative impacts to the species and/or ecological communities identified in this review. We are happy to work with you to ensure that our state's precious natural heritage is conserved and preserved for future Mississippians.

Sincerely,



Kyle Swanier, Conservation Biologist  
Mississippi Natural Heritage Program  
(601) 576-6047

The Mississippi Natural Heritage Program (MNHP) has compiled a database that is the most complete source of information about Mississippi's rare, threatened, and endangered plants, animals, and ecological communities. The quantity and quality of data collected by MNHP are dependent on the research and observations of many individuals and organizations. In many cases, this information is not the result of comprehensive or site-specific field surveys; most natural areas in Mississippi have not been thoroughly surveyed and new occurrences of plant and animal species are often discovered. Heritage reports summarize the existing information known to the MNHP at the time of the request and cannot always be considered a definitive statement on the presence, absence or condition of biological elements on a particular site.



United States Department of Agriculture

May 14, 2015

Piet deWitt, PhD  
7325 Puncheon Landing Road  
Pocomoke, MD 21851

Dear Mr. deWitt,

In response to your letter dated March 7, 2015, regarding the Draft Supplemental Environmental Impact Statement for the Long Beach Watershed, the Natural Resources Conservation Service is providing the following responses to your questions.

1. Did NRCS prepare a Notice of Intent to prepare this statement and if it did, when was the Notice published in the Federal Register? Yes, a Notice of Intent was prepared in April 2014 and sent to the responsible federal agency for publication.
2. In addition, what impact statement is the subject statement supplementing? The Long Beach Watershed Plan and Environmental Impact Statement, 1989.
3. Is the Town Creek Watershed project still active or has it been terminated? Yes, Town Creek is an existing watershed with an approved plan and EIS in MS. The sponsors were requesting NRCS begin the process to build Dam No. 5. The EIS was required to be updated. As we begin the process of updating the EIS, the watershed funding was stopped, therefore we stopped work on updating the EIS. I would not say the project is dead but waiting on further funding.

Respectfully,

A handwritten signature in blue ink, appearing to read "K. Readus".

Kurt Readus  
State Conservationist

Natural Resources Conservation Service  
100 W. Capitol Street, Suite 1321  
Jackson, MS 39269  
Voice (601) 965-5205  
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*Culberson*

7325 Punchcon Landing Road  
Pocomoke, Maryland 21851  
March 7, 2015

Kurt Readus  
State Conservationist  
Natural Resources Conservation Service  
100 West Capital Street  
Suite 1321 Federal Building  
Jackson, Mississippi 39269

Dear Mr. Readus:

On March 6, 2015, the U.S. Environmental Protection Agency (EPA) announced the availability of a draft supplemental environmental impact statement (EIS) on the "Long Beach Watershed." You were identified as the contact person for the document. I am writing to ask if the NRCS prepared a Notice of Intent to prepare this statement, and if it did, when the Notice was published in the Federal Register. In addition, what impact statement is the subject statement supplementing?

In addition, on July 25, 2003, the EPA announced the availability of a draft supplemental EIS on the "Town Creek Watershed." Is this project still active or has it been terminated?

Thank you for your time and consideration.

Respectfully,

*Piet deWitt*

Piet deWitt, PhD



United States Department of Agriculture

May 14, 2015

Joseph Paige  
Water Quality Certification Branch  
Mississippi Department of Environmental Quality  
Post Office Box 2261  
Jackson, MS 39225

Dear Mr. Paige,

In response to your letter dated March 6, 2015, regarding the Draft Supplemental Environmental Impact Statement for the Long Beach Watershed, the Natural Resources Conservation Service would like to thank you for reviewing the draft SEIS. NRCS agrees with your comments regarding obtaining permits from the U.S. Army Corps of Engineers and the MDEQ.

The project sponsors will work with the appropriate agencies to obtain the required permits before construction begins.

Respectfully,

A handwritten signature in blue ink, appearing to read "K. Readus", written over a horizontal line.

Kurt Readus  
State Conservationist

Natural Resources Conservation Service  
100 W. Capitol Street, Suite 1321  
Jackson, MS 39269  
Voice (601) 965-5205  
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*Culberson*

STATE OF MISSISSIPPI  
PHIL BRYANT  
GOVERNOR  
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY  
GARY C. RIKARD, EXECUTIVE DIRECTOR

March 6, 2015

Mr. Kurt Readus  
Natural Resource Conservation Service  
100 W. Capitol Street, Suite 1321  
Jackson, Mississippi 39269

Dear Mr. Readus:

Re: Environmental Impact Statement  
Long Beach Watershed  
Harrison County

The Mississippi Department of Environmental Quality, Environmental Permits Division has received your request for comments on the above referenced project by letter dated February 9, 2015. Based on the information provided,

1. It appears that the project area may contain jurisdictional waters and could require a Clean Water Act Section 404 permit. The applicant should contact Mr. Munther Sahawneh (251-694-3782) of the U.S. Army Corps of Engineers- Mobile District for further information.
2. Please be aware, if this project is disturbing more than 1 acre of land, it will require coverage under a construction general permit for control of stormwater/sediment runoff. Please contact the appropriate branch of MDEQ permitting for this coverage prior to commencement of construction at 601-961-5171.

Please feel free to contact me at (601) 961-5624, should there be any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Joe Paige".

Joseph Paige  
Water Quality Certification Branch

cc: Mr. Munther Sahawneh, U.S. Army Corps of Engineers, Mobile District

OFFICE OF POLLUTION CONTROL  
POST OFFICE BOX 2261 • JACKSON, MISSISSIPPI 39225-2261 • TEL: (601) 961-5171 • FAX: (601) 354-6612 • [www.deq.state.ms.us](http://www.deq.state.ms.us)  
AN EQUAL OPPORTUNITY EMPLOYER

**LONG BEACH WATER MANAGEMENT DISTRICT**

POST OFFICE BOX 748  
LONG BEACH, MISSISSIPPI 39560

November 24, 2008

Mr. David Felder  
U. S. Fish and Wildlife Service  
6578 Dogwood View Parkway, Suite A  
Jackson MS 39213

Subject: Solicitation of Views  
Supplemental Environmental Impact Statement for Long Beach Watershed  
Canal No. 1 Channel Modifications  
Harrison County, Mississippi

Dear Mr. Felder:

The Natural Resources Conservation Service and Long Beach Water Management District conducted a Scoping Meeting for the subject project on August 14, 2007. The scoping meeting contributed to the development of a scope relating to the preparation of Supplemental Environmental Impact Statement (EIS) to update the "Environmental Impact Statement for Long Beach Watershed, Harrison County, Mississippi" dated October 1989.

In association with the Long Beach Water Management District, the Natural Resources Conservation Service is proceeding with the preparation of the Supplemental EIS for Canal No. 1. The purpose of this letter is to solicit views from agencies and elected and appointed officials; which by law, interest, or expertise can assist the project planners with the timely identification of economic, social, and environmental opportunities and constraints within the study area.

A map showing the limits of the project is attached. The following information can be downloaded from the ftp site referenced below:

- The minutes of the August 14, 2007 scoping meeting;
- a PDF file of the initial EIS;
- comments received in association with the September 2001 scoping meeting;
- aerial imagery of the study area; and
- associated project maps.

Because some of the files are large, it is suggested that you copy the files to a local drive before you try to open them.

[ftp://ftp.neel-schaffer.com/Mississippi/Jackson/Public/Long\\_Beach\\_Canal\\_1\\_SEIS/](ftp://ftp.neel-schaffer.com/Mississippi/Jackson/Public/Long_Beach_Canal_1_SEIS/)

Written comments regarding the project should be directed to:

Alane C. Young, RPG  
Neel-Schaffer, Inc.  
833 Highway 90, Suite 13  
Bay Saint Louis, MS 39520  
Phone (228) 466-5155  
Fax (228) 466-5156

Email - [alane.young@neel-schaffer.com](mailto:alane.young@neel-schaffer.com)

The District requests that all comments be provided by **November 30, 2008**.

If you have any questions or need additional information, please contact Alane directly.

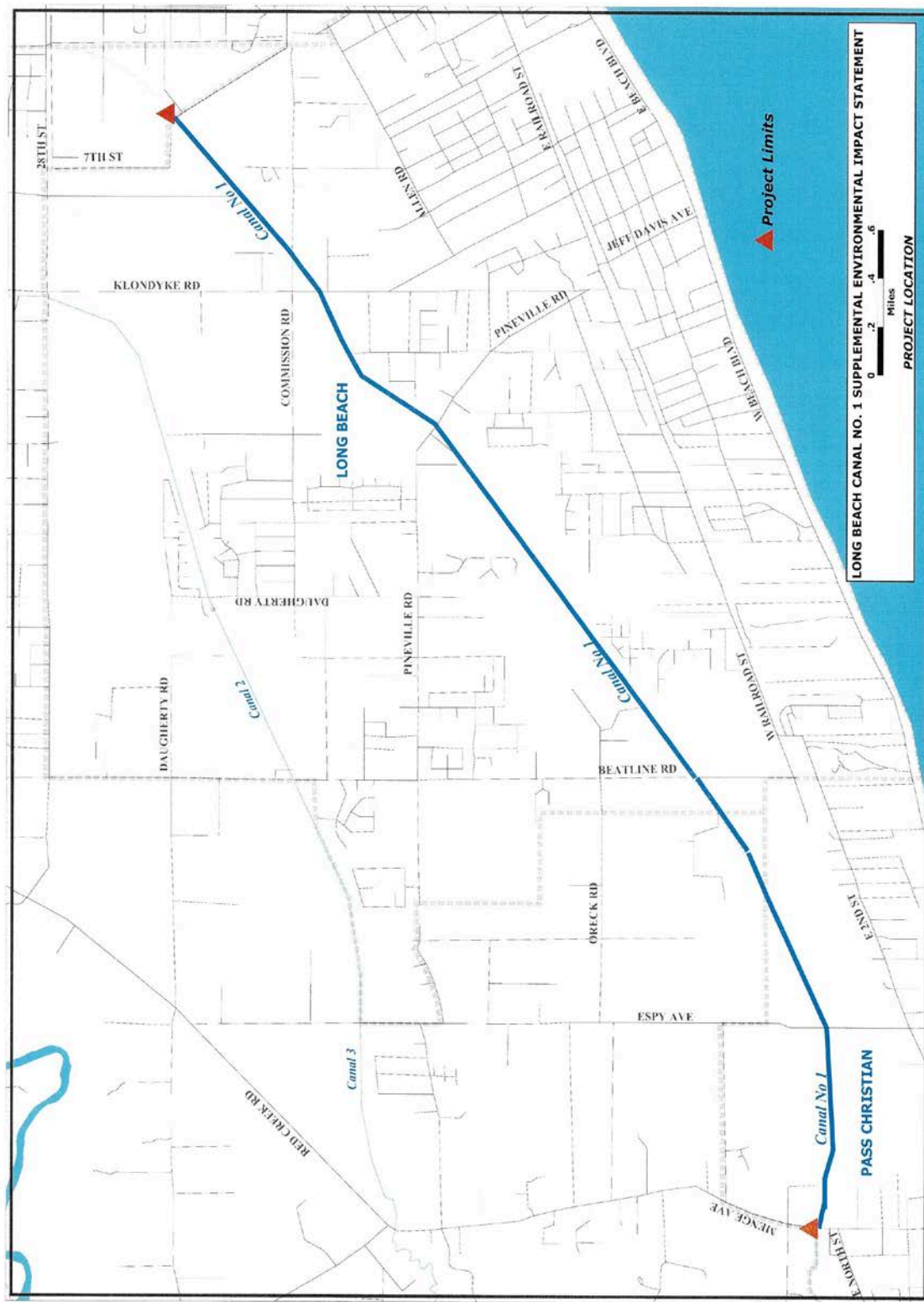
Sincerely,

*Brett Mallette*

Brett Mallette  
Chairman

Enclosures









DEPARTMENT OF THE ARMY  
MOBILE DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 2288  
MOBILE, AL 36628-0001

December 2, 2008

Mr. Brett Mallett, Chairman  
Long Beach Water  
Management District  
Post Office Box 748  
Long Beach, Mississippi 39560

Dear Mr. Mallett:

We are in receipt of your request in preparation of a Supplemental Environmental Impact Statement from the Department of the Army (DA) to perform dredging and fill. Specifically, the project is in Canal Number 1, Long Beach, Harrison County, Mississippi.

The request has been assigned the file number **SAM-2008-01918-JBM**, which should be referred to in all future correspondence with this office. The request is also identified as Canal Number 1 Channel Modifications.

I have been assigned as Project Manager for this action and can be reached by telephone at (251) 690-3222, by e-mail at [john.b.mcfadyen@usace.army.mil](mailto:john.b.mcfadyen@usace.army.mil) or by mail to: U.S. Army Corps of Engineers, Mobile District, Attention: CESAM-RD-C, McFadyen, Post Office Box 2288, Mobile, Alabama, 36628-0001. After I have thoroughly reviewed your application package, I will let you know if additional information is needed before we can complete our evaluation.

Please take a moment to visit our website where you can track the status of your application and complete our customer satisfaction survey. Our website is: [www.sam.usace.army.mil/rd/reg/](http://www.sam.usace.army.mil/rd/reg/).

Sincerely,

A handwritten signature in dark ink, appearing to be "J. McFadyen".

John McFadyen  
Project Manager  
Regulatory Division

Copy Furnished:

Neel-Schaffer, Inc.  
Attention: Ms. Alane C. Young  
✓ 833 Highway 90, Suite 13  
Bay St. Louis, Mississippi 39520

Mississippi Department  
of Marine Resources  
1141 Bayview Avenue, Suite 101  
Biloxi, Mississippi 39530

**DEPARTMENT OF THE ARMY**

VICKSBURG DISTRICT, CORPS OF ENGINEERS

4155 CLAY STREET

VICKSBURG, MISSISSIPPI 39183-3435

REPLY TO  
ATTENTION OF:

December 2, 2008

Operations Division

SUBJECT: Long Beach Water Management District, Canal No. 1  
Channel Modifications, Harrison County, Mississippi

Ms. Alane C. Young  
Neel-Schaffer, Incorporated  
833 Highway 90, Suite 13  
Bay Saint Louis, Mississippi 39520

Dear Ms. Young:

Your recent correspondence, subject as above, has been forwarded for action to the Mobile District, Corps of Engineers, since the proposed projects fall within the geographic boundaries of their District.

Their contact information is:

U.S. Army Engineer District, Mobile  
Attention: Regulatory Branch  
Post Office Box 2288  
Mobile, Alabama 36628  
Telephone: (251) 690-2658

Sincerely,

A handwritten signature in cursive script, reading "Michael F. McNair", is positioned above the typed name.

Michael F. McNair, R.F.  
Chief, Regulatory Branch



MISSISSIPPI  
DEPARTMENT OF WILDLIFE, FISHERIES, AND PARKS

Sam Polles, Ph.D.  
Executive Director

December 4, 2008

Alane C. Young, RPG  
Neel-Schaffer, Inc.  
833 Highway 90  
Suite 13  
Bay Saint Louis, MS 39520

Re: Canal No. 1 Channel Modifications  
Solicitation of Views  
Long Beach, Harrison County, Mississippi

R# 6961

To Alane Young,

In response to your request for information dated November 24, 2008, we have searched our database for occurrences of state or federally listed species and species of special concern that occur within 2 miles of the site of the proposed project. Please find our concerns and recommendations below.

Since 1989, the Mississippi coast has suffered a great deal of habitat loss since the agency last commented on this project. The comments included below are a result of these losses and a better understanding of how channel modifications can affect sensitive habitats such as marshes and tidal streams.

According to the information provided, there are documented occurrences of the following species in St. Louis Bay, Bayou Portage, and their surrounding tributaries and marshes: Manatee, *Manatus trichechus* (LE, MS; LE, Fed); Saltmarsh Topminnow, *Fundulus jenkinsi* (LE, MS); Mississippi Diamondback Terrapin, *Malaclemys terrapin pileata* (S2); Gulf Salt Marsh Snake, *Nerodia clarkii clarkii* (S2); and Least Killifish, *Heterandria formosa* (S3).

Reference information:

LE - Endangered - A species which is in danger of extinction throughout all or a significant portion of its range.  
S2 - A species that is imperiled in MS because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.  
S3 - Rare or common in Mississippi (on the order of 21 to 100 occurrences).

Mississippi Museum of Natural Science • 2148 Riverside Drive • Jackson, Mississippi 39202-1353 • (601) 354-7303

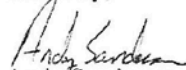
The widening and desnagging of channels will increase stormwater runoff conveyance and stream flow velocities, and potentially increase transport of contaminants. Precautions are planned to prevent erosion and sedimentation within the project area and areas upstream of the natural stream segments. However, increased stream velocity may increase erosion and sedimentation of the downstream natural channel areas resulting in negative impacts to crucial marsh habitat and to water quality. In addition, the project could result in wetland disturbance and elimination caused by increased development in areas where the risk of flooding is decreased.

Should the proposed project be permitted, we suggest the following be considered as partial mitigation:

Place into perpetual easements, parcels of wetlands or land that could be restored to wetlands along either side of the canals to contain increased stormwater capacities. This would benefit the marshes and bays that the canals feed and prevent further habitat degradation in these areas. This would help compensate for potential increased floodwater capacity, slow water velocity, prevent downstream erosion, and filter out contaminants and sediment before stormwater enters the canals. It would also prevent these areas from becoming developments within the floodplain and eliminate the need for continued canal modifications.

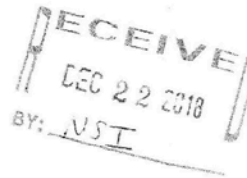
Please feel free to contact us if we can provide any additional information, resources, or assistance that will help minimize negative impacts to the species and/or ecological communities identified in this review. We are happy to work with you to ensure that our state's precious natural heritage is conserved and preserved for future Mississippians.

Sincerely,



Andy Sanderson, Ecologist  
Mississippi Natural Heritage Program  
(601) 354-6367, ext. 117

The Mississippi Natural Heritage Program (MNHP) has compiled a database that is the most complete source of information about Mississippi's rare, threatened, and endangered plants, animals, and ecological communities. The quantity and quality of data collected by MNHP are dependent on the research and observations of many individuals and organizations. In many cases, this information is not the result of comprehensive or site-specific field surveys; most natural areas in Mississippi have not been thoroughly surveyed and new occurrences of plant and animal species are often discovered. Heritage reports summarize the existing information known to the MNHP at the time of the request and cannot always be considered a definitive statement on the presence, absence or condition of biological elements on a particular site.



MISSISSIPPI  
DEPARTMENT OF MARINE RESOURCES

December 18, 2008

Mr. Brett Mallett, Chairman  
Long Beach Water Management District  
P.O. Box 748  
Long Beach, MS 39560

RE: DMR-090274

Dear Mr. Mallett:

The Department of Marine Resources in cooperation with other state agencies is responsible under the Mississippi Coastal Program (MCP) for managing the coastal resources of Mississippi. Proposed activities in the coastal area are reviewed to insure that the activities are in compliance with the MCP.

The Department has received a request for assistance in the preparation of a Supplemental Environmental Impact Statement (EIS) to review proposed channel modifications to Canal 1 located in Long Beach, Harrison County, Mississippi. While it appears that tidal systems will not be directly impacted by the proposed action, indirect impacts to tidal and tidally influenced waters and wetlands located further downstream are possible. Additionally, the final Supplemental EIS should contain anticipated impacts to tidal and non-tidal areas downstream from the proposed action area. A Joint Application form (enclosed) should be submitted to this office for review and determination of Coastal Zone Consistency (CZC) for the proposed project. Thank you for the opportunity to comment on your request.

For more information or questions concerning this correspondence, contact Greg Christodoulou with the Bureau of Wetlands Permitting at (228) 523-4109.

Sincerely,

Greg Christodoulou  
Coastal Resource Management Specialist

Enclosure

cc: Alane C. Young, Neel-Schaffer, Inc. ✓

1141 Bayview Avenue, Suite 101 • Biloxi, MS 39530 • (228) 374-5000



From: McFadyen, John B SAM [John.B.McFadyen@usace.army.mil]  
Sent: Monday, December 22, 2008 7:10 AM  
To: Alane.young@neel-schaffer.com  
Cc: Steele, Jason W SAM; Sahawneh, Munther N SAM; Litteken, Craig J SAM; Smith, Thomas E SAM; Brown, Linda T SAM; Jacobson, Jennifer L SAM  
Subject: Long Beach Canal 1 Supplemental EIS (SEIS)

Alane;

This responds to the Long Beach Water Management District's (LBWMD) letter of November 24, 2008, regarding the subject project.

The Corps would like to be a co-operating agency with the NRCS in the preparation of the SEIS. If a Section 404 or Section 10 permit is required we would use the SEIS as our NEPA document to support a permit decision. Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for certain structures or work in or affecting navigable waters of the U.S., prior to conducting the work (33 U.S.C. 403). Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands, prior to conducting the work (33 U.S.C. 1344). For regulatory purposes, the Corps of Engineers defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Navigable waters of the U.S. are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified as navigable by the Mobile District.

Please be advised that land clearing operations involving vegetation removal with mechanized equipment such as front-end loaders, backhoes, or bulldozers with sheer blades, rakes, or discs; windrowing vegetation; land leveling; or other soil disturbance in areas subject to Corps jurisdiction may be considered placement of dredged material under our jurisdiction. In order to determine the level of Corps jurisdiction a wetland delineation of the project area (including dredged material disposal sites) should be conducted in accordance with Gulf Coastal Plain Regional Supplement to the 1987 Wetland Delineation Manual. Results of the delineation will be reviewed/approved by the Corps in order to determine the limits of Corps jurisdiction under Section 404. Any work in waters of Canal 1 subject to the ebb and flow of the tide will require authorization under Section 10, therefore, upstream limits of tidal waters in Canal 1 should be identified.

The SEIS should include a statement of the project purpose and need as well as addressing compliance with 40 CFR part 230 (Section 404(b)(1) guidelines), 33 CFR part 320.4, General policies for evaluating permit applications and 33 CFR part 332, Compensatory mitigation for losses of aquatic resources. The SEIS should also address the secondary (indirect) impacts of the channel improvements as well as cumulative impacts as required by the NEPA. The proposed Canal 1 project appears to be compatible with the Corps (MsCIP) project on Canals 2&3, which is scheduled to begin in the first quarter of 2009.

We look forward to working with the LBWMD, NRCS and Neel-Shaffer, Inc. on the SEIS.

John B. McFadyen, P.G.  
Project Manager  
U.S. Army Corps of Engineers, Mobile District  
Regulatory Division, Coastal Branch (SAM-RD-C)  
(251) 690-3222 Voice (251) 690-2660 Fax  
NOTE: new e-mail address john.b.mcfadyen@usace.army.mil



## *Jena Band of Choctaw Indians*

P. O. Box 14 • Jena, Louisiana 71342-0014 • Phone: 318-992-2717 • Fax: 318-992-8244

December 23, 2008

Alane C. Young, RPG  
Neel-Schaffer, Inc.  
833 Highway 90, Suite 13  
Bay Saint Louis, MS 39520

**RE: SOLICITATION OF VIEWS  
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR  
LONG BEACH WATERSHED  
CANAL NO. 1 CHANNEL MODIFICATION  
HARRISON COUNTY, MISSISSIPPI**

To Whom It May Concern:

Reference is made to your letter, dated November 24, 2008, concerning the above-proposed project.

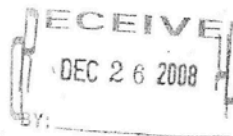
After thorough review of the documents submitted, it has been determined that there will be no significant impact in regards to the Jena Band of Choctaw Indians.

Should you have any questions, please feel free to call me.

Sincerely,

A handwritten signature in cursive script that reads "Lillie McCormick".

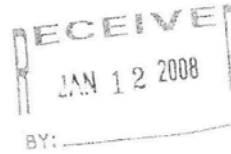
Lillie McCormick  
Environmental Director  
Jena Band of Choctaw Indians  
Ph: 318-992-8258  
Fax: 318-992-8244  
[lmccormickjbc@centurytel.net](mailto:lmccormickjbc@centurytel.net)





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

January 5, 2009



Alarie C. Young, RPG  
Neel-Schaffer, Inc.  
833 Highway 90, Suite 13  
Bay Saint Louis, MS 39520

SUBJ: EPA's Scoping Comments for the Supplemental Environmental Impact Statement (SEIS)  
Long Beach Watershed, Canal No. 1 Channel Modifications, Harrison County, MS

Dear Mr. Young:

Consistent with Section 102(2)(c) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) Region 4 appreciates the opportunity to provide scoping comments on the proposed Supplemental Environmental Impact Statement (SEIS) for the proposed canal project. It is our understanding that the Long Beach Water Management District will be modifying Canal No. 1 from the crossing at Menge Avenue in Pass Christian, Mississippi, to the crossing at 7<sup>th</sup> Street in Long Beach, Mississippi. It is our understanding that the SEIS is intended to supplement and update the original Environmental Impact Statement (EIS) developed for the Long Beach Watershed in October 1989.

EPA recommends that the Supplemental Environmental Impact Statement (SEIS) include discussions on the proposed project's impacts to: existing hydraulics and hydrology (including discussions on changes in the FEMA designated floodplain and the "adopted regulatory floodway"), water quality, aquatic habitat and wildlife, terrestrial habitat and wildlife (including migratory birds), protected species, soils, geology, hazardous materials, underground storage tanks, the transportation network, recreational opportunities, air quality, noise, cultural resources, aesthetics, socioeconomic, and land use. EPA Region 4's Water Protection Division has specifically requested that the SEIS include an analysis of how the proposed project could (or will) serve as a diversion canal for any adjacent streams. In particular, the analysis should investigate impacts to the drainage conditions within the Turkey Creek basin, an EPA priority watershed. The SEIS should also address the indirect and cumulative effects of the proposed project.

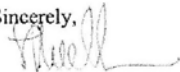
EPA Region 4 recommends that the SEIS identify any waters impacted by the proposed project that are classified "High Quality Waters" or "Nutrient Sensitive Waters" or are included on the State of Mississippi's current 303(d) list of impaired waters. Any Total Maximum Daily Load (TMDL) studies that have been completed should also be fully identified.

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Should you have questions, please feel free to coordinate with Region 4 staff member, Paul Gagliano, P.E., at 404/562-9373 or at [gagliano.paul@epa.gov](mailto:gagliano.paul@epa.gov), or Region 4's Mississippi Watershed Coordinator, Mr. Kenneth Dean, at 404/562-9378 or at [dean.william-kenneth@epa.gov](mailto:dean.william-kenneth@epa.gov).

Sincerely,



Heinz J. Mueller, Chief  
NEPA Program Office  
Office of Policy and Management



engineers  
planners  
surveyors  
environmental  
scientists  
landscape  
architects

April 29, 2009

Mr. David Felder  
U. S. Fish and Wildlife Service  
6578 Dogwood View Parkway, Suite A  
Jackson MS 39213

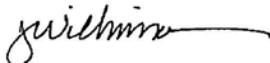
Re: Long Beach Water Management District  
Canal No. 1 Channel Modifications  
Supplemental Environmental Impact Statement

Dear Mr. Felder:

The attached Solicitation of Views (SOV) letter was sent to you and to other representatives of the U. S. Fish and Wildlife Service last fall shortly after the above-referenced project was initiated by the Long Beach Water Management District and Natural Resources Conservation Service. To date there has been no response from anyone at your agency, and as we cannot complete the project without USFWS input, I am writing to request your assistance in securing the needed information. Specifically, we need to know if there are any federally designated threatened or endangered species in Harrison County, Mississippi which could conceivably be affected by this project.

It is possible that our original SOV letter should have been directed to someone other than yourself. If that is the case, please forward the attached copy to someone in your office who will be able to respond. Your assistance in this matter will be greatly appreciated. Please feel free to contact me at (228) 374-1211 or at [james.wilkinson@neel-schaffer.com](mailto:james.wilkinson@neel-schaffer.com) if you have any questions about the project.

Sincerely,  
NEEL-SCHAFFER, INC.



James D. Wilkinson  
Planner III

attachment

772 Howard Avenue, Biloxi, MS 39530-3820, 228.374.1211, Fax 228.374.1216



**United States Department of the Interior**

FISH AND WILDLIFE SERVICE  
Mississippi Field Office  
6578 Dogwood View Parkway, Suite A  
Jackson, Mississippi 39213

May 4, 2009

Mr. James Wilkinson  
Neel-Schaffer  
772 Howard Avenue  
Biloxi, Mississippi 39530

Dear Mr. Wilkinson:

The U.S. Fish and Wildlife Service (Service) has received your letter dated April 29, 2009, regarding the Long Beach Water Management District's Canal No. 1 Channel Modifications Project in Harrison County, Mississippi. Our comments are submitted in accordance with the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

There are no known federally listed threatened or endangered species, or their habitats, within the project area. Therefore, the Service anticipates no impacts to any listed species to occur as a result of the proposed project.

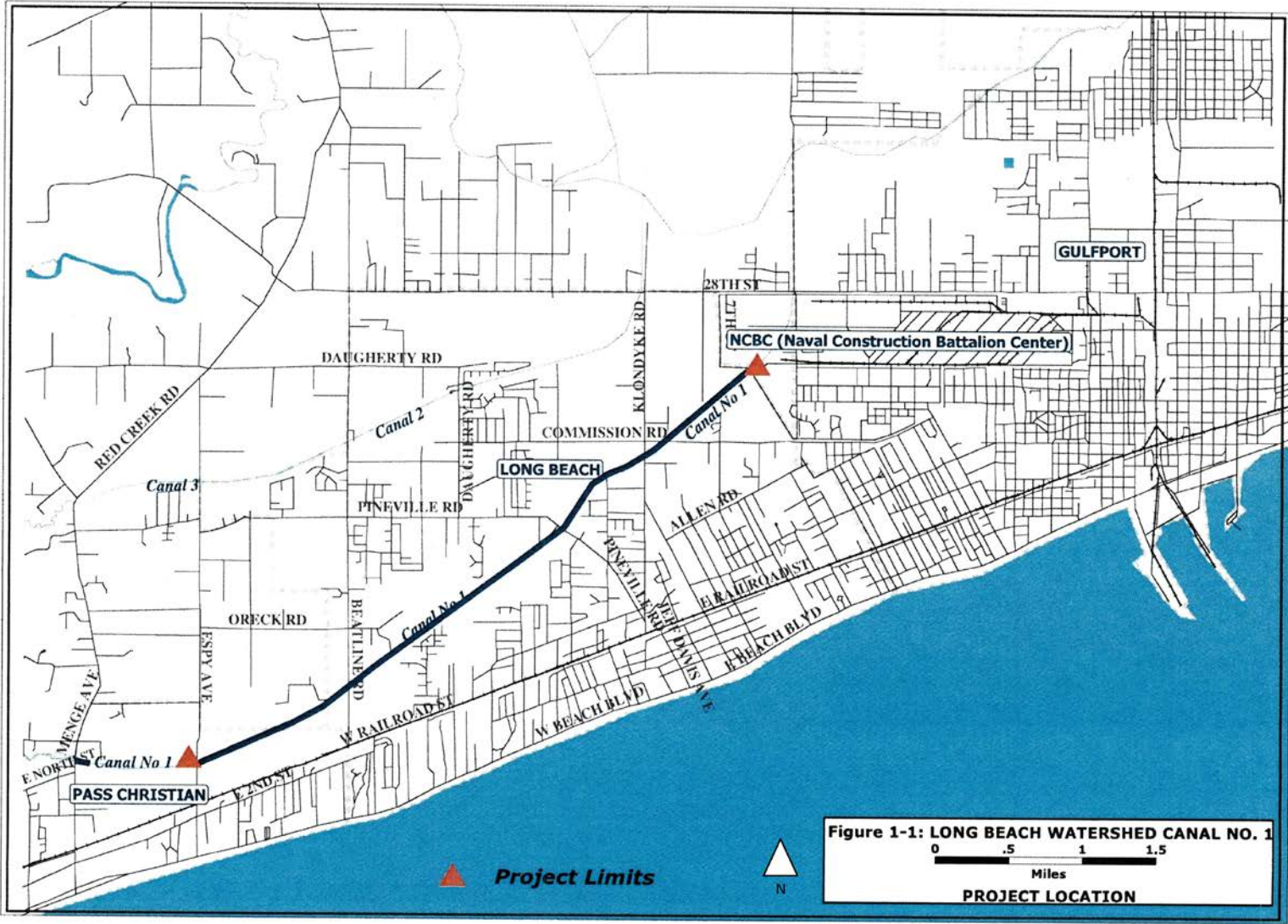
If you have any questions, please contact our office, telephone: (601) 321-1131.

Sincerely,

David Felder  
Fish and Wildlife Biologist

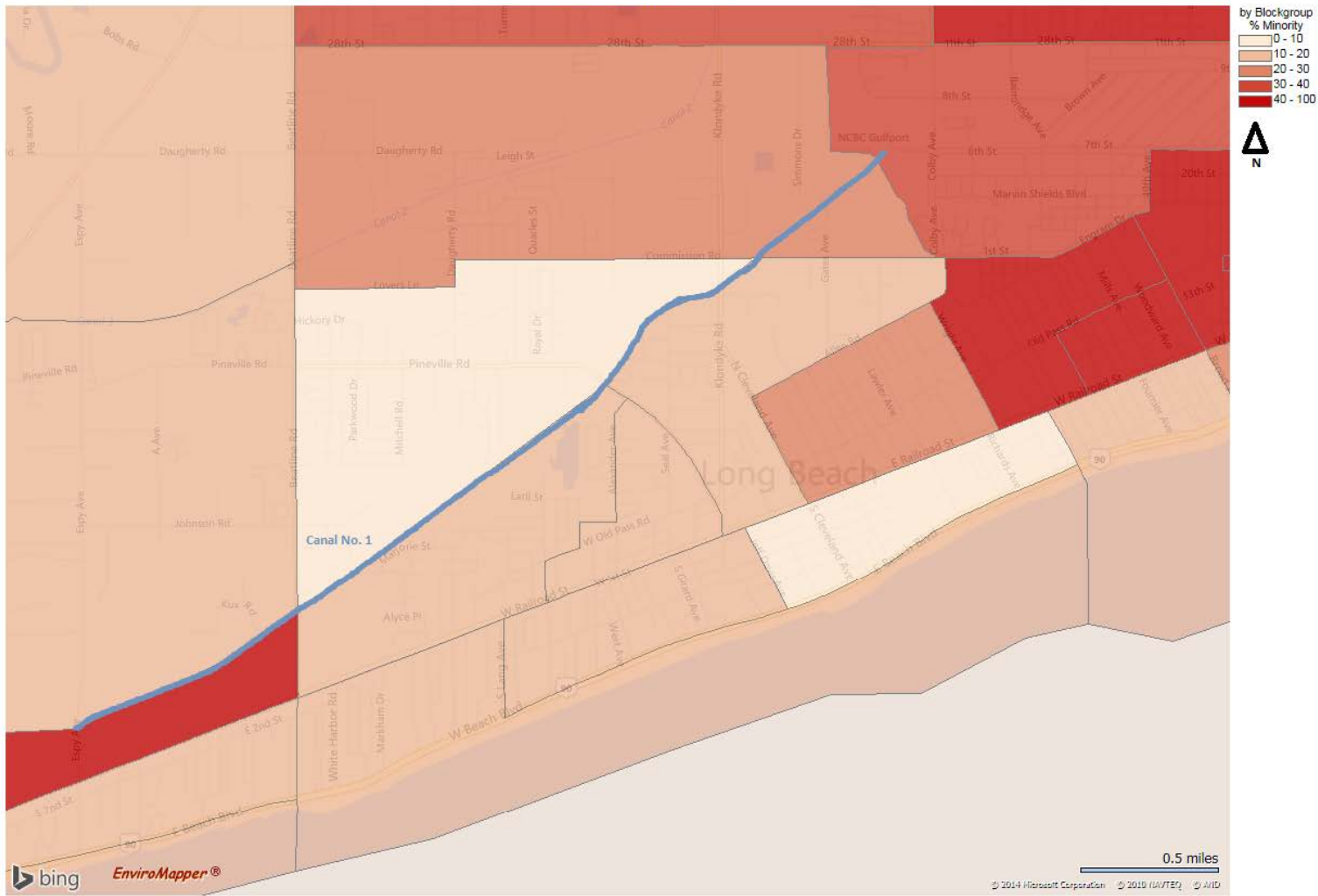
## **Appendix B: Project Map**

**Figure No. 1**  
Long Beach Watershed Map



## **Appendix C: Support Maps**

**Figure No. 2**  
Environmental Justice Minority Groups  
Canal 1



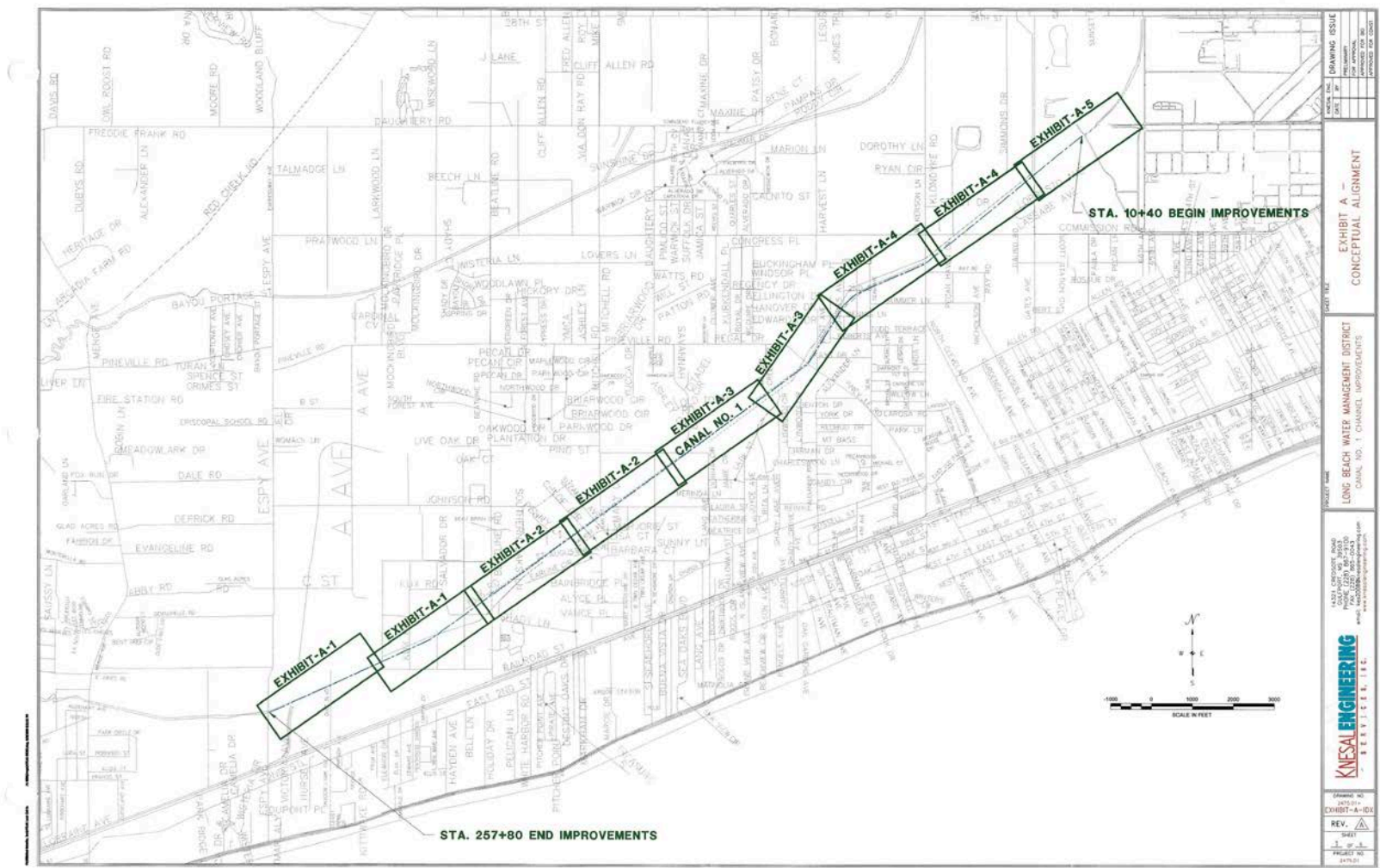


**Figure No. 3**  
Environmental Justice % Below Poverty Level  
Canal 1





Figure No. 4  
Conceptual Alignment





**Figure No. 5**  
Conceptual Alignment Inset 1

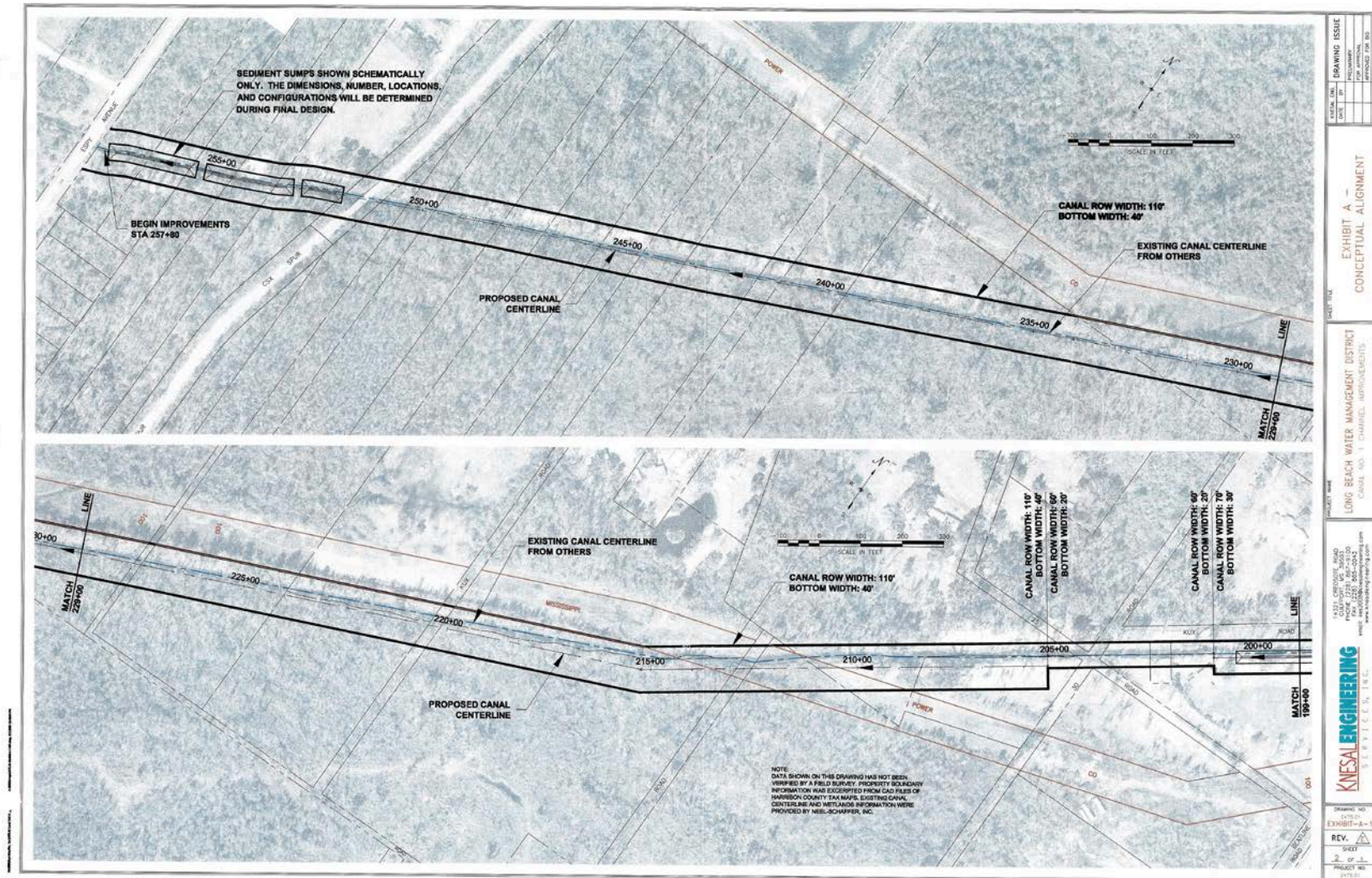
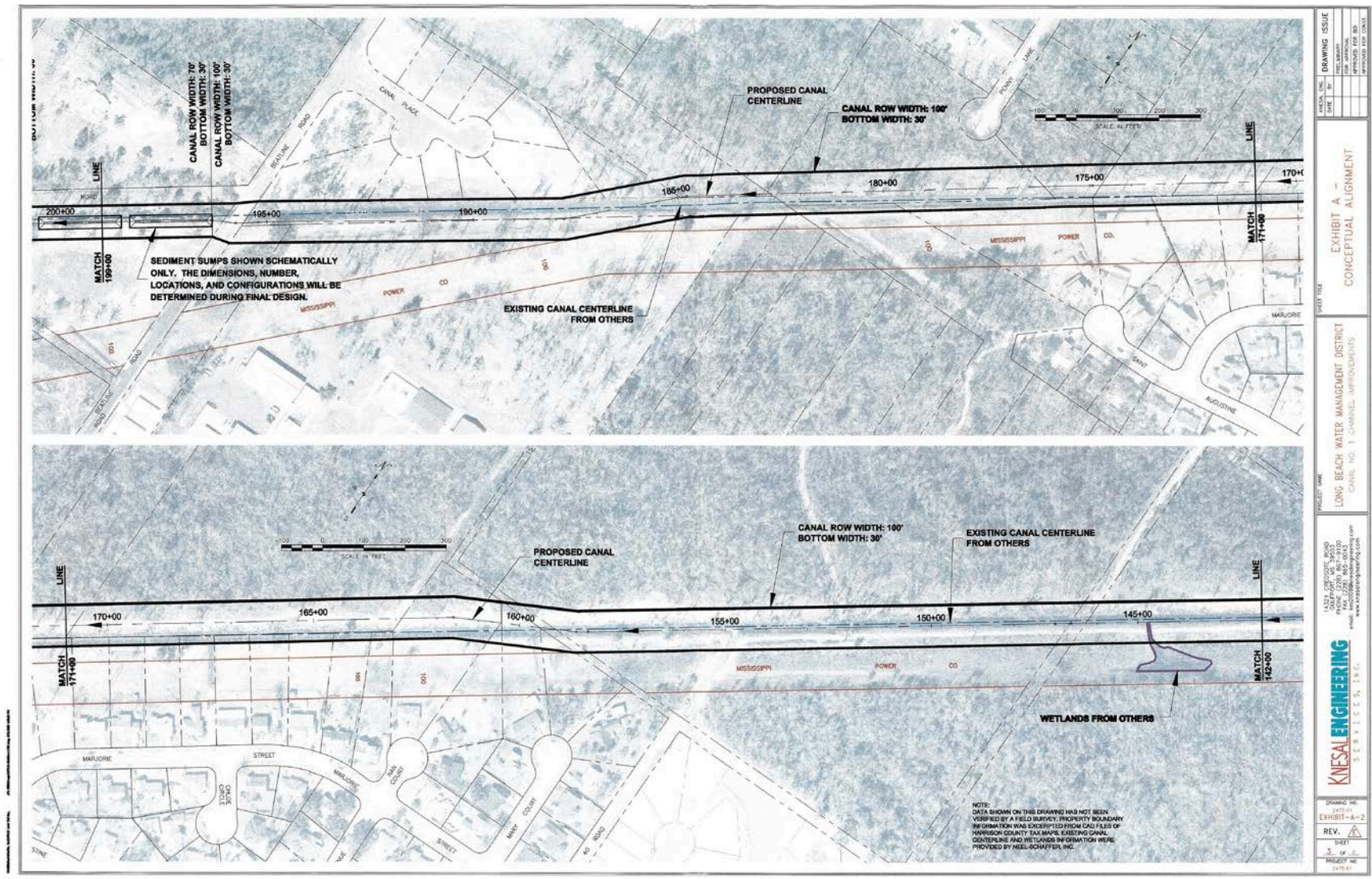




Figure No. 6  
Conceptual Alignment Inset 2





**Figure No. 7**  
Conceptual Alignment Inset 3

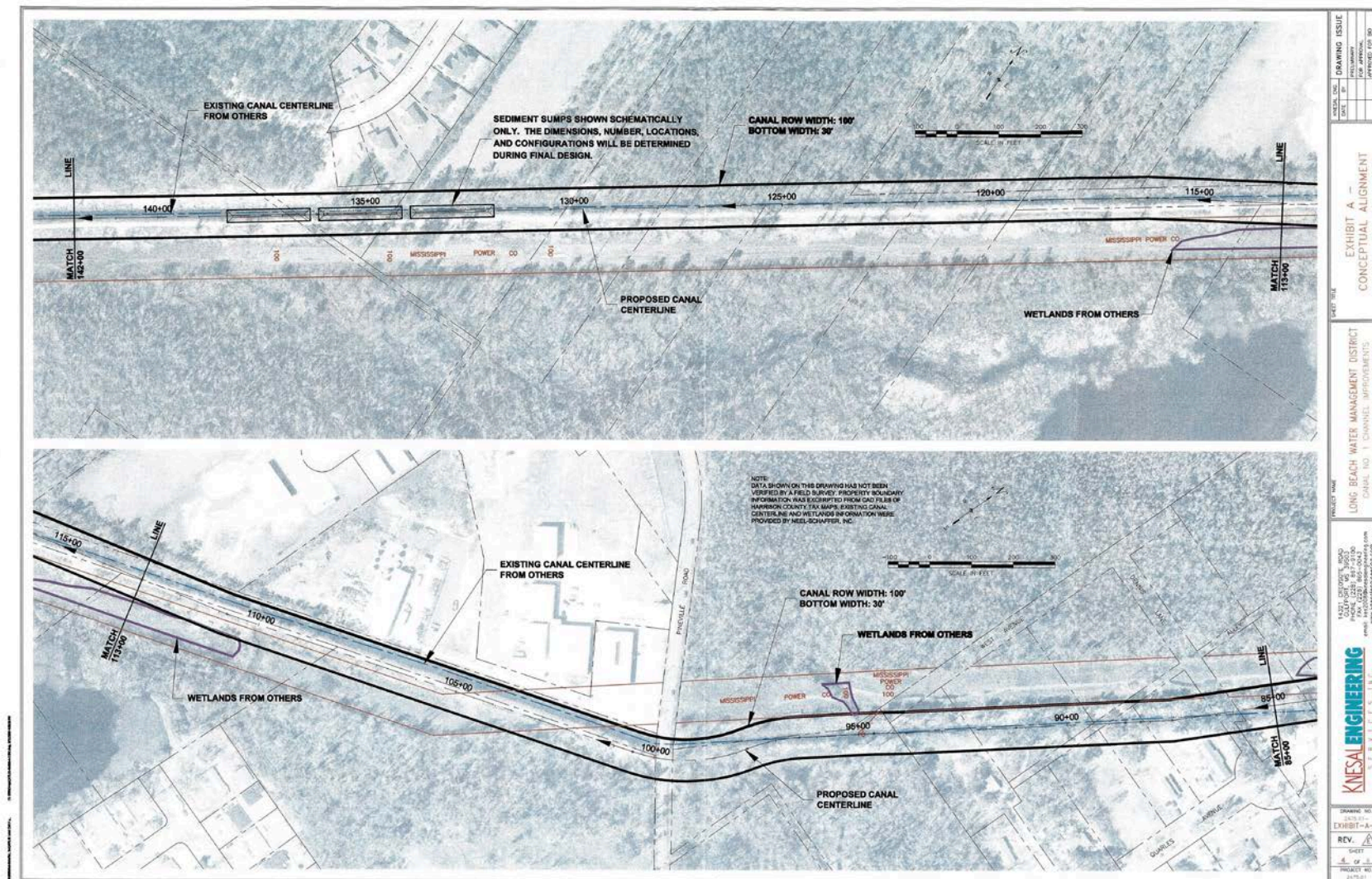




Figure No. 8  
Conceptual Alignment Inset 4

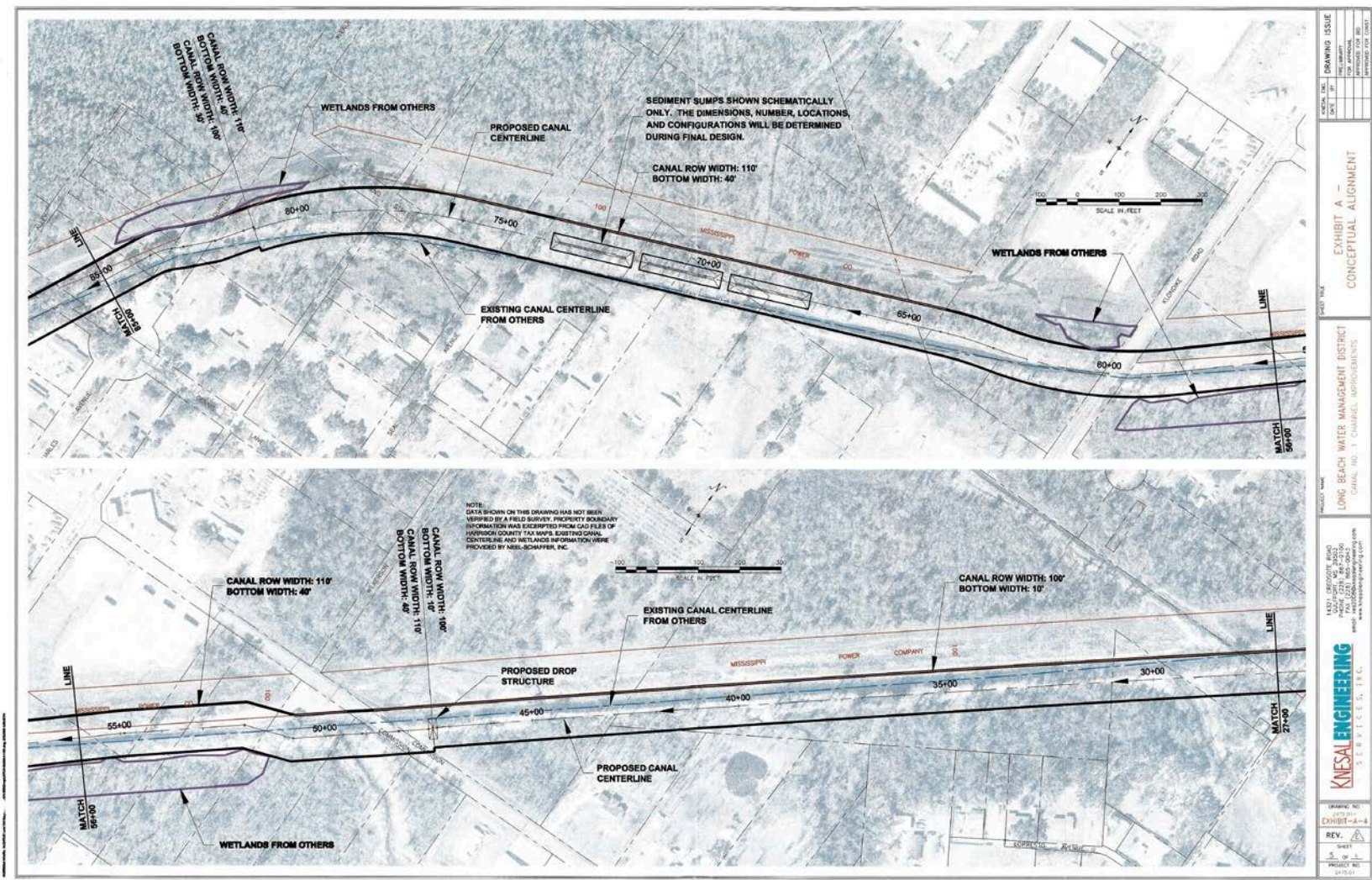




Figure No. 9  
Conceptual Alignment Inset 5



## **Appendix D: Investigation and Analysis Report**

## Investigation and Analysis Report

### Biology

The survey undertaken in October of 2008 covered a corridor 125 feet wide on either side of the canal. Location data for use in mapping jurisdictional wetlands and waters of the U.S. were collected with a Trimble GeoXH global positioning system (GPS) unit. The data collected were then entered into a geographic information systems (GIS) program for analysis. Project area photographs, a list of plant species observed and data sheets for delineated wetlands may be found in appendices to the Final Wetlands Technical Report. A follow-up visit to the project area was conducted jointly by ERG biologists with the USACE project manager on March 23, 2009. At that time the Corps representative recommended certain modifications to the initial delineation. The ERG biologists returned to the project area on April 22, 2009 to evaluate the USACE recommendations. The changes were subsequently made and incorporated in the final report.

The identification of hydrophytic vegetation was based on the “National List of Plant Species” that Occur in Wetlands” (Reed 1988). Observed plant species were classified as obligate wetland, facultative wetland, facultative, facultative upland or upland. Hydrophytic vegetation is prevalent in an area when the dominant species in a plant community are typically adapted for life in saturated soil conditions (Environmental Laboratory 1987).

A determination regarding the presence of wetland hydrology was made on the basis of on-site visual observation of geomorphic and hydrological characteristics, including inundation, saturation, watermarks, drift lines, drainage patterns, oxidized root channels, and water-stained leaves. Soil pits were also excavated to reveal saturated soil present in areas not inundated at the time of the survey.

Finally, soil profiles were examined to seek out hydric soil indicators. Additional information was obtained from the Soil Survey of Harrison County, Mississippi (U.S. Department of Agriculture 1975). And a list of hydric soils in the area was obtained from the local Natural Resources Conservation Service (NRCS) office.

### Engineering

#### *Project formulation*

Alternatives considered were a) No-Action (Future without project), b) Channel Improvement, and c) non-structural measures (flood proofing and relocation). Costs for Channel Improvement and Non-structural measures were updated from 1989 data.



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## *Engineering Design*

Engineering design data from the 1989 EIS was used for analysis in this update. Unit costs were estimated and the quantities from the original designs were used to develop cost estimates. These costs were compared to the figures developed in the 2012 study, and the costs indexed from the 1989 study, and found to be reasonably comparable. Costs were updated using ENR construction cost index and current construction costs. The 2012 study was the update done by Neel-Schaffer for the Long Beach Water Management District.

## Economics

A database of houses used by the U.S. Army Corps of Engineers for the Section 205 Turkey Creek Flood Damage Reduction Study was used as a base to gather information on houses in the floodplain. The houses were then ground checked to determine which houses had been demolished, rebuilt to new elevations and also for new construction. The Harrison County Assessor website was used to update house values for completing the economic analysis. Damage Factors from the Corps of Engineers (U.S. Army Corps of Engineers, 2000) were used to calculate depth damages to structure and content damages for the following storms: 500-year, 100-year, 50-year, 25-year, 10-year, 5-year, 2-year and 1-year. The depth damage factors used are a generic factor; the damages from actual floods could be more or less than the figures calculated. A build out analysis for new construction in the area due to the implementation of this project was not completed. Many of the houses that were destroyed during Hurricane Katrina have not been rebuilt; any new construction along the canal is regulated by the local floodplain board. The decrease in depth and velocities of the flood waters due to this project being implemented will not result in a decrease of the floodplain area relevant enough to warrant an increase in housing construction.

The indirect benefits were calculated as 10% of agricultural related benefits, 15% for urban benefits and 25% of road and bridge benefits as shown in the Economics Guide, page 32, dated 1964. This is the latest data found with the indirect benefit calculations.

## Hydrology

The original planning for the Long Beach Watershed Plan was completed in 1989. Engineering field surveys were completed for the selected bridge and valley sections required. Hydrologic data including reach lengths and N-Values were developed as needed. TR-61 or the WSP2 computer program was utilized to compute the water surface profiles needed for hydraulics. Hydrologic parameters including reach lengths, drainage area and Time of Concentration (Tc) were developed as needed. Runoff curve numbers were developed for both present and with project conditions. TP-40 was utilized to obtain the 24 Hour duration rainfall for the selected storm frequencies if applicable. The eight storms analyzed for each alternative included the 1-Yr, 2-Yr, 5-Yr, 10-Yr, 25-Yr, 50-Yr, 100-Yr, and 500-Yr frequency 24-Hour duration rainfall events. Alternatives evaluated included the present condition (Existing Channel) and the future condition (Designed Channel) runs. The TR20 computer program for project formulation was used to analyze the hydrology for the different alternatives. Detailed flood insurance studies from FEMA were utilized to calibrate the WSP2 and TR20 models for present conditions. Output from the WSP2 and TR20

models provided all the H&H data needed to evaluate economic damages and benefits for the alternatives.

The original hydraulic and hydrologic (H&H) models and channel design were to be used for all analysis needed to complete the updated EIS. However, the final H&H runs could not be located in the files. A decision was made to use the best data available to update the depths of inundation at each structure needed for economic analysis. A matching set of WSP2 and TR20 runs for each alternative (Present and Future Condition) dated October of 1987 were selected for use. A thorough check of these runs did not reveal any major problems with the input/output that would raise concerns about the accuracy of the results. It should be noted that the results of these H&H runs do not match the results in the final plan. However, since the economic analysis is based on the relative difference between the two alternatives, these runs are considered more than adequate for this task. Care has been taken to refer to any results taken from these runs in general terms or as differences between alternatives rather than specific numbers to avoid confusion.

Due to the lack of original data files and the methods used to set up the WSP2 and TR20 models, additional work was required to create all the data needed to analyze the Long Beach Watershed. The main reason this additional work was required was that the TR20's were setup to only produce peak discharges at limited locations. It should be noted that this method does not necessarily affect the quality of the results, but certainly increases the workload required. All of the original files and data provided were thoroughly read and researched to glean all pertinent data. All of the basic input data required for WSP2 and TR20 for each alternative were compiled in Excel to check and validate the original data used. All of the road and valley cross sections used in the original analysis for each alternate was entered into Excel and graphed to facilitate the research and analysis needed. This same cross-sectional data was also utilized to develop input for an additional cross-sectional ratings computer program executed for the purpose of obtaining more complete top width, velocity, and flow area data. The rating tables produced by WSP2 for each cross-section and alternate were also entered into an Excel spreadsheet to compute the average velocity for each rating point. This same data was also utilized to interpolate any and all missing data for each cross-section, storm, and alternate; including peak elevations, flow areas, and average velocities. Finally, all pertinent peak results for each cross-section, storm, and alternate were compiled into a single Excel spreadsheet for further use in analyzing the Long Beach Watershed.

The economic analysis was initiated by creating an Excel table that contained the peak elevation at each cross-section for each storm and alternative. An additional spreadsheet was provided by the economist that included the identification, floor elevation, and location (Lat-Long) of each structure inventoried by the economist. A Geo-HEC-RAS project was developed and utilized to create a common stationing between the cross-sections and the structures being evaluated. The peak elevation for each alternative and storm combination was then interpolated at each structure location/station using the peak elevation results from TR20. The depth of inundation for each structure by each storm and alternative was then computed. The reduction in flooding from present to future condition for each structure and storm was also computed and analyzed. This data was then returned to the economist for the computation of damages and benefits.

Additional analysis was conducted to determine the effects of the project on the area downstream of the designed Canal-1 channel or downstream of Espy Avenue. This area of concern was not addressed during the original planning of the Long Beach Watershed. The downstream area was analyzed by modifying an existing USACE HEC-RAS model to run a steady flow analysis for each alternate using the peak discharges produced by the corresponding TR20 model. A sensitivity analysis using different starting elevations was conducted with the average high tide being selected as the appropriate starting elevation. The results of these runs were transferred into an Excel spreadsheet to facilitate further analysis. The average change in the elevations and velocities over multiple cross-sections were computed for each alternative. The difference in the without and with project results produced the expected average increase in elevation and velocity for a given stream reach. The same HEC-RAS model was also utilized to produce the peak elevations for each storm and alternative needed for the economic analysis of the structures located downstream of Espy Avenue. The model used the same starting elevations and discharges that were used in the original planning effort.

Additional analysis was also conducted to address some concerns over the possible overflow of Turkey Creek into the upper end of Canal-1 during storm events. Determination of the exact flow that each of the three separate stream systems would carry for a given storm is extremely difficult if not impossible to model. Flow quantity and paths in this complex area would also change over time and from storm to storm. Therefore, the analysis concentrated on where any possible overflow would likely be conveyed downstream rather than the quantity of the overflow. A USACE HEC-RAS model for Turkey Creek and Canals 1 and 2-3 was used as a base model. Inspection of the cross-sections used in the HEC-RAS model was extremely helpful to help understand the dynamics of the overflow. Heavy use was also made of the ArcMap 10.0 analysis tools and available data layers such as ortho imagery and topographic sheets. The post-Katrina LiDAR elevation dataset was the most heavily used and helpful data used for this analysis. Numerous contours and flow paths were developed from the LiDAR dataset to help determine the path of any overflow. Limited time was spent in looking at the difference in timing of the storm hydrographs for Turkey Creek and Canal-1.

It is highly recommended that new hydrologic & hydraulic models be developed during the final design that covers Canal-1 from 28th Street downstream to Saint Louis Bay. This comprehensive model will allow any updates needed to the hydraulics or hydrology to be made and can incorporate any changes made to the final Canal-1 design. This model should be used to update the appropriate Flood Insurance Rate Maps (FIRMs) needed to comply with the National Flood Insurance Program (NFIP). The final design phase should also include a check of the existing house and business inventory to update any changes needed. The updated inventory and model will ensure that all downstream effects of the constructed channel on current improvements have been accurately identified and mitigated for.

### Prime Farmland and Soils Information

Prime farmland and soils information was obtained from “Soil Survey of Harrison County, Mississippi,” issued in June 1975.

## **Appendix E: Other Supporting Information**

**Project Scoping Meeting:  
September 20, 2001**

On September 20, 2001 a site visit to the proposed channel 1 of the Long Beach project was conducted. The group toured portions of the watershed including bridges at street crossings and an area potentially suitable for a retention basin. Attendees were:

Gerald Miller, Environmental Protection Agency  
Jerry Brashier, Mississippi Department of Marine Resources  
Robert Seyfarth, Mississippi Department of Environmental Quality  
Daniel Gregg, US Fish & Wildlife Service  
Patric Harper, US Fish & Wildlife Service  
Allison Felsher, Mississippi Department of Marine Resources  
Wayne Ellis, Natural Resources Conservation Service  
Jim Garner, Natural Resources Conservation Service  
Larry Williams, Natural Resources Conservation Service  
Tyree Harrington, Natural Resources Conservation Service  
Scott Culberson, Natural Resources Conservation Service  
Robin Shelby, Natural Resources Conservation Service

We need follow-up maintenance to assure the minimal number of trees per acre on mitigation sites. Better yet, mitigation should be through purchasing into a bank where improvements have already been established.

What happens to people down stream when additional water gets to the end of the enlarged channel? Be sure to identify the area that will get increased flooding.

Will the project be designed to provide relief for the current residents or for future development as well? The NEPA document should state this decision. If future needs are to be planned into the project, we need to know how many building construction variances have been issued in the floodplain since entering into the flood insurance program? Also, what is the rate of building construction within the watershed.

If this canal ties into Turkey Creek drainage, the additional flow must be addressed.

The old channel has healed nicely and looks good as habitat; water quality is good; clearing will be problematic.

Could clearing be done on only one side of the channel?

We need local ordinances that require all developments to hold, on site, the first inch of rainfall or the 30-year storm, whichever is greater.

Water quality will definitely decrease with installation of the enlarged ditch. This could have various impacts, including the fisheries of Bay St. Louis, which is one of the most important fisheries in Mississippi. We need to check for available water quality data.

Retention basins are needed to trap run-off and reduce the amount of pollution leaving the drainage area. Buffer strips should offset any deficiency in this aspect.



United States  
Department of  
Agriculture

Soil  
Conservation  
Service

Suite 1321, Federal Building  
100 West Capitol Street  
Jackson, Mississippi 39269

May 17, 1993

Mr. Bill Bunkley  
U.S. Army Corps of Engineers  
OP-SP  
P. O. Box 2288  
Mobile, AL 36628

Dear Mr. Bunkley:

As you requested, the following is being transmitted for your use:

1. A listing of those individuals who participated in the environmental coordination of Long Beach Watershed;
2. A listing of mitigation acres for the Long Beach Watershed;
3. A listing of soils in the Long Beach Watershed showing those with hydric and hydric inclusion soils;
4. A land rights map for channel 2-3 showing in detail the location of the channel and spoil placement for work areas; a wetlands mitigation map showing those soils which are hydric and those with hydric inclusions; included on this map are the locations of channel 1 and channel 2-3 area of spoils placement and area of mitigation.

I hope this information is what you will need. If not, please let me know, and we will provide additional information.

Sincerely,

Fredrick E. Keeter  
Water Resources Staff Leader

Attachments

cc: Billy Davis, Area Conservationist, SCS, Hattiesburg, MS  
David Peacock, District Conservationist, SCS, Gulfport, MS  
Calvin McElreath, Civil Engineer, SCS, Oxford, MS

FEkeeter:db

YELLOW COPY



The Soil Conservation Service  
is an agency of the  
Department of Agriculture

## ENVIRONMENTAL COORDINATION FOR LONG BEACH WATERSHED WITH OUTSIDE AGENCIES

<u>Agency</u>	<u>Personnel</u>	<u>Address</u>	<u>Telephone No.</u>
Environmental Protection Agency	Gerald Miller	345 Courtland St., N.W. Atlanta, GA 30365	(404) 347-3776
Office of Pollution Control	Jim Morris	P. O. Box 10385 Jackson, MS 39289-0385	(601) 961-5151
U.S. Fish and Wildlife Service	Danny Dunn	P. O. Drawer 1190 Daphne, AL 36526	(205) 441-5181
Miss. Department of Wildlife Conservation - Bureau of Marine Resources	Diane Hunt	P. O. Drawer 959 Long Beach, MS 39560	(601) 385-5860



## MITIGATION AREAS FOR LONG BEACH WATERSHED

<u>Location</u>	<u>Acres of Hydric Soils</u>	<u>Mitigation Acres</u>
Areas along Channel 2-3	--	32
Areas along Channel 1	--	52
Area in TS8S - R12W Section 16	46	90
Area in TS8S - R12W Section 20	4	8
Area in TS8S - R12W Section 19	22	32
Total	72	214

**Project Scoping Meeting:  
August 14, 2007**

**LONG BEACH WATER MANAGEMENT DISTRICT****POST OFFICE BOX 748  
LONG BEACH, MISSISSIPPI 39560**

Andy Hughes  
Division Administrator  
Federal Highway Administration  
666 North Street, Suite 105  
Jackson, MS 39202-3199

Subject: Scoping Meeting, Long Beach Water Management District  
Supplemental Environmental Impact Statement for Long Beach Watershed  
Canal No. 1 Channel Modifications  
Harrison County, Mississippi

Dear Mr. Hughes,

The Natural Resources Conservation Service and Long Beach Water Management District will conduct a Scoping Meeting for the subject project at 10:00 a.m. on August 14, 2007, at the West Harrison County Civic Center, 4670 West Espy Avenue, Long Beach, , Mississippi. This scoping meeting is a follow-up to the meeting and site visit held on September 20, 2001 for proposed work on Canal No. 1. This scoping meeting will assist us in developing a Supplemental Environmental Impact Statement (EIS) to update the "Environmental Impact Statement for Long Beach Watershed, Harrison County, Mississippi" dated October 1989.

The purpose of this meeting is to solicit views from agencies and elected and appointed officials which by law, interest, or expertise can assist the project planners with the timely identification of economic, social, and environmental opportunities and constraints within the study area.

A preliminary Aerial map showing both the original study area and the current conditions will be available for review, as well as City of Long Beach planning information identifying plans for rebuilding the area.

Enclosed with this letter are a tentative meeting agenda, a project fact sheet, and a map of the project limits. Additional information, including a PDF of the initial EIS, comments received in association with the September 2001 scoping meeting, aerial imagery of the study area, and associated project maps can be downloaded from the following ftp site. Because some of the files are large, it is suggested that you copy the files to a local drive before you try to open them.

**[ftp://ftp.neel-schaffer.com/Mississippi/Jackson/Public/Long\\_Beach\\_Canal\\_1\\_SEIS/](ftp://ftp.neel-schaffer.com/Mississippi/Jackson/Public/Long_Beach_Canal_1_SEIS/)**

We request you review the material and provide any questions, problems, or concerns that you have about the project during the meeting. This includes providing any information you may have concerning the study area at the meeting. **To assist us in preparing for this meeting, by August 7, 2007, please email the consultant Project Manager at [barry.brupbacher@neel-schaffer.com](mailto:barry.brupbacher@neel-schaffer.com) regarding who will attend from your organization.**

## **LONG BEACH WATER MANAGEMENT DISTRICT**

**POST OFFICE BOX 748  
LONG BEACH, MISSISSIPPI 39560**

At the conclusion of the meeting, the Water Management District hopes to reach a consensus regarding the project Purpose and Need; and the technical studies, which will have to be accomplished to support the preparation of a Supplemental EIS. Written comments regarding the project should be directed to:

Barry Brupbacher  
Neel-Schaffer, Inc.  
800 Jackson Avenue, Suite B  
Mandeville, LA 70448  
Email - [barry.brupbacher@neel-schaffer.com](mailto:barry.brupbacher@neel-schaffer.com)

The District requests that all comments be provided by August 21, 2007.

If you have any questions or need additional information, please contact Barry directly by email or phone at 985-778-3105.

Sincerely,

Brett Mallette  
Chairman

Enclosures

# **LONG BEACH WATER MANAGEMENT DISTRICT**

**POST OFFICE BOX 748  
LONG BEACH, MISSISSIPPI 39560**

## **SCOPING MEETING**

**SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (SEIS)**

**FOR THE**

**LONG BEACH WATERSHED AFFECTED BY THE PROPOSED**

**CANAL NO. 1 CHANNEL MODIFICATIONS**

**PROPOSED BY THE**

**NATURAL RESOURCES CONSERVATION SERVICE (NRCS)**

**FOR THE**

**LONG BEACH WATER MANAGEMENT DISTRICT**

**HARRISON COUNTY, MISSISSIPPI**

## **PRELIMINARY AGENDA**

**(Meeting Begins at 10:00 a.m.)**

- I. Welcome**
- II. Project Overview Presentation**
- III. Viewing of Exhibits and GIS files**
- IV. Questions**
- V. Lunch (11:30 a.m.)**
- VI. Field Trip to site**
- VII. Return to Facility for Final Discussion and Comments**

**Meeting Minutes  
August 14, 2007  
Scoping Meeting  
Long Beach Water Management District  
Supplemental Environmental Impact Statement for Long Beach Watershed  
Canal No. 1 Channel Modifications  
Harrison County, Mississippi**

**Attendance:**

Larry Wilson, USDA, Natural Resources Conservation Service (NRCS)  
Tyree Harrington, USDA, NRCS  
Tom Smith, Corps of Engineers  
Randall Harvey, Corps of Engineers  
John McFadyen, Corps of Engineers  
Randy Wilson, Mississippi Forestry Commission  
Brett Mallette, Long Beach Water Management District (LBWMD)  
Dave Marshall, LBWMD  
Stacey Schultz, Dukes, Dukes, Keating & Faneca, P.A.  
Bill Knesal, Knesal Engineering  
Joe Culpepper, Knesal Engineering  
Robert Walker, Neel-Schaffer, Inc.  
Barry Brupbacher, Neel-Schaffer, Inc.  
Rosemary Aldridge, Neel-Schaffer, Inc.  
Jim Wilkinson, Neel-Schaffer, Inc.  
Liz Cox, Neel-Schaffer, Inc.

Barry Brupbacher opened the meeting and introduced Larry Williams, who presented a brief history of the project. Mr. Williams addressed the following points:

- Initial EIS completed in 1989
- Project hydrology considered flows from three drainage basins (Turkey Creek drainage basin, Canal No. 1 drainage basin, and drainage basin for Canals No. 2 and No 3). Flows from the three basins intermingle during storm events.
- EIS provided for improvements to Canal No 1, and Canals No 2/3. Computed benefits were not isolated by drainage basin.
- Benefits were considered over a 100-year life cycle
- In 2001, since Canal No. 1 improvements had not been implemented, NRCS re-opened the scoping process in association with LBWMD; project continued on hold until present effort.
- Because so much time has elapsed since publication of initial EIS, NRCS now believes that a Supplemental EIS may be required in order to carry the Canal No 1 project improvements forward into construction.

Mr. Brupbacher then reviewed the handout exhibits. A copy of the handout package can be downloaded at the following ftp site:

**[ftp://ftp.neel-schaffer.com/Mississippi/Jackson/Public/Long\\_Beach\\_Canal\\_1\\_SEIS/](ftp://ftp.neel-schaffer.com/Mississippi/Jackson/Public/Long_Beach_Canal_1_SEIS/)**

Mr. Brupbacher then introduced the Turkey Creek Flood Damage Reduction Study for discussion. The COE Study was completed just prior to the landfall of Hurricane Katrina in 2005. COE Engineer Randal Harvey indicated that:

- Hydraulics/hydrology modeling considered entire Turkey Creek watershed, including Turkey Creek, Canals No. 1, 2 and 3
- Alternatives were evaluated to determine the maximum net benefit.
- Improvements to Canals No 1, 2 and 3 were not included in the final recommendations because they did not produce the best economic benefit.

Tom Smith noted that COE planning post Katrina documented the need for a number of projects in Harrison County, including a project which would improve Canals No. 2/3. The Corp would be undertaking the design for that project utilizing in-house resources.

Corps representatives indicated that all data compiled in their recent work would be made available for work on Canal No. 1

Other topics discussed included:

1. Project Area – Bill Knesal confirmed that the project area would not include the Naval Construction Battalion Center
2. Wetlands – project will affect wetlands. Corps requested copies of the delineation maps developed for the initial EIS. Larry indicated that he would search NRCS files for the information
3. Design Features– The initial design concept provided for a canal section with 3 to 1 slide slopes, which should support re-vegetation of the canal banks. Also, a sediment trap was provided to mitigate water quality concerns. The initial design located excavated spoil on a berm next to the canal. However, Bill Knesal, engineer for the LBWMD, indicated that excavated spoil would be relocated to a disposal area.
4. Environmental Justice – Based on available demographic information, environmental justice is not considered a concern.
5. Bike Path –MDOTD has approved a transportation enhancement grant for a bike path, one segment of which is conceptually located adjacent to Canal No. 1 within the project area. Brett Mallette, representing the LBWMD, clarified the position of the District with respect to the Bike Path. Brett indicated that the easements obtained for the canals were strictly for drainage. Consequently, the collocation of a bike path within the canal easement would necessitate some entity to secure new easements to allow for the construction of a bike path. He also noted that the District is concerned that a bike path may impair access to the canal for maintenance, and that this issue would have to be resolved.

Following lunch, a tour of the project area was undertaken and the group returned to the meeting facility for concluding remarks relating to the requirements for supplementing the 1989 EIS.

**Cooperating Agencies** – Invitations will be issued to the Corps of Engineers, the USF&WS, EPA, the Mississippi Department of Marine Resources, and the Mississippi Department of Environmental Quality.

**Technical Updates** - Supplemental EIS should include updates to the following Technical Studies:

- Cultural Resources
- Natural Resources, including water quality, habitat, Threatened and Endangered Species and Wetlands

Mr. Brupbacher reminded all parties that written comments should be submitted by August 21, 2007.

There being no other business, the scoping meeting was adjourned.



# Quick Facts

About the  
Long Beach Water Management District  
and NRCS

Canal Number 1 Channel Modifications  
Supplemental Environmental Impact  
Statement (SEIS)

Harrison County, MS

1<sup>st</sup> Edition



## PROJECT PURPOSE AND NEED

In order to improve flood control along Canal Number 1 and reduce costs associated with flooding, the Natural Resources Conservation Service (NRCS) and the Long Beach Water Management District (LBWMD) propose to modify the existing Canal Number 1 through construction of channel modifications. These modifications include structural measures to enlarge portions of the existing channel and perform selective snagging along the remainder of the channel. An original Environmental Impact Statement (EIS) was conducted for this work in 1989, encompassing work on Canal Number 1, Canal Number 2, and Canal Number 3. Most of the improvements to Canal Number 2 and 3 have been completed. This Supplemental EIS (SEIS) is being prepared to update the portion of the EIS work previously prepared relating to Canal Number 1. The proposed project is needed to reduce costs and impacts to families from flooding along Canal Number 1.

## LOCATION

Canal Number 1 is a man-made canal constructed in about 1918. The four miles of Canal Number 1 proposed to be modified begins at the watershed boundary near the U.S. Navy Construction Battalion base and continues westward to Espy Avenue.

## RECOMMENDED ALTERNATIVE

"Structural measures" are the recommended alternative for the project. The planned structural measures consist of 3.8 miles of channel enlargement of earth-lined channel and 0.2 miles of rock riprap lined channel. The earth-lined channel will have 3 to 1 side slopes and bottom widths ranging from 30 to 40 feet. The rock riprap-lined reach is planned due to limited right-of-way widths. Selective snagging will be performed along 0.7 miles of Canal Number 1 to remove log jams, free or affixed logs, and rooted trees in danger of falling into the channel.

For more information, contact:

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[barry.brupbacher@neel-schaffer.com](mailto:barry.brupbacher@neel-schaffer.com)

## NATURAL ENVIRONMENT

The original EIS provides a detailed analysis of the natural environment impacted by this project. The purpose of this SEIS will be to review and update current conditions of the study area and evaluate impacts from the proposed project. Below is a summary of impacts from the original EIS.

Resource	Effect
Air Quality	No effect
Coastal Zone	No effect
Threatened/Endangered Species	None present
Fish and Wildlife habitat	Loss of some units
Floodplains	Reduced
Historic and Cultural Properties	No effect
Prime and Unique Farmland	No effect
Water Quality	Temporary reduction during construction
Wetlands	No net change
Wild and Scenic Rivers	Not present

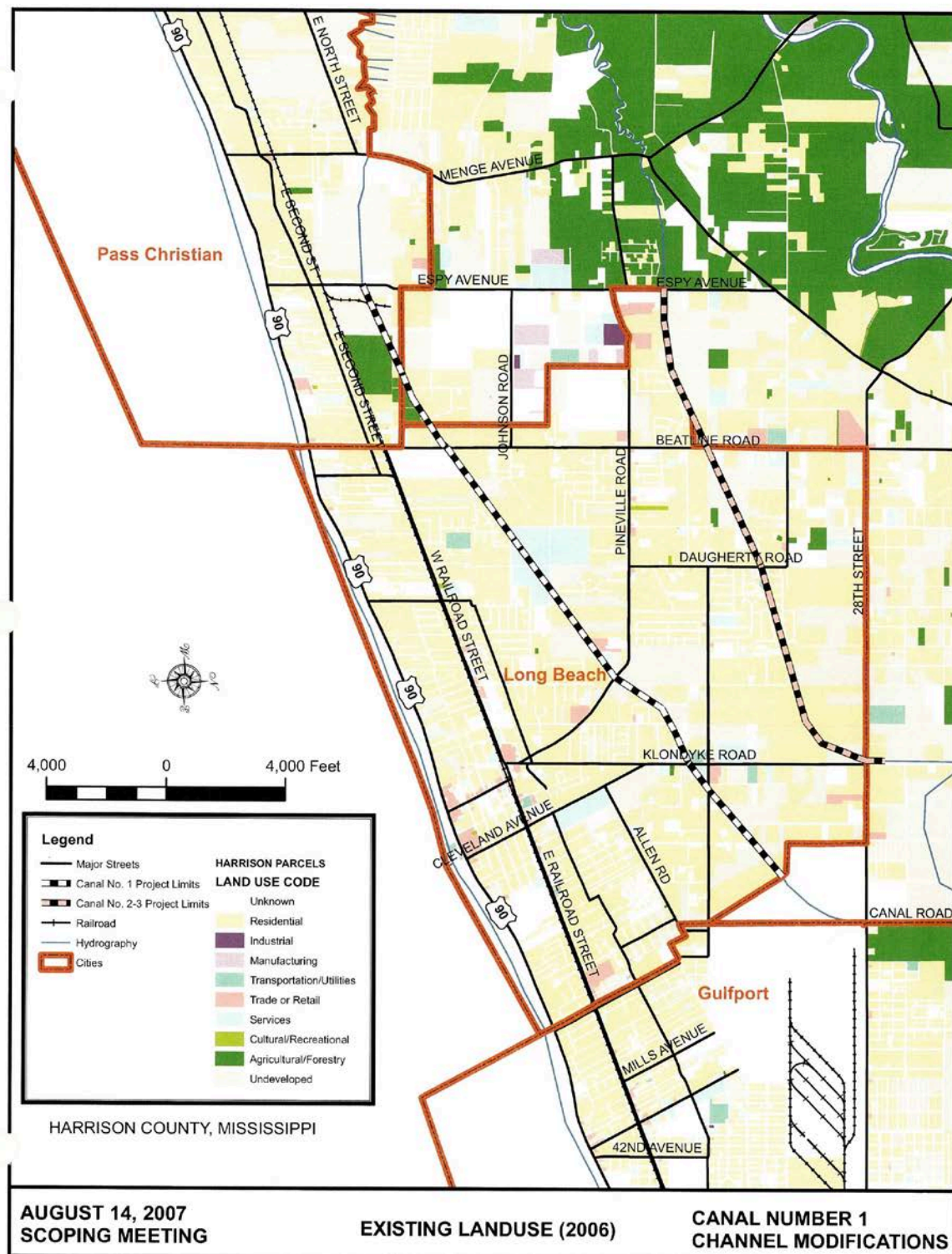
## MITIGATION MEASURES

The loss of forest land habitat will be mitigated by the planting of hardwood species in the right-of-way areas along the canal and within the Long Beach Industrial Park. The channel will be constructed with 3:1 side slopes to encourage establishment of herbaceous aquatic vegetation. This vegetation will reduce bank erosion and improve sediment trapping. Also, sediment traps will be located at the lower end of the channel to reduce downstream sedimentation during and following construction.

## PUBLIC INVOLVEMENT

The Public Involvement Program is outlined below and is subject to review and modification as the project develops.

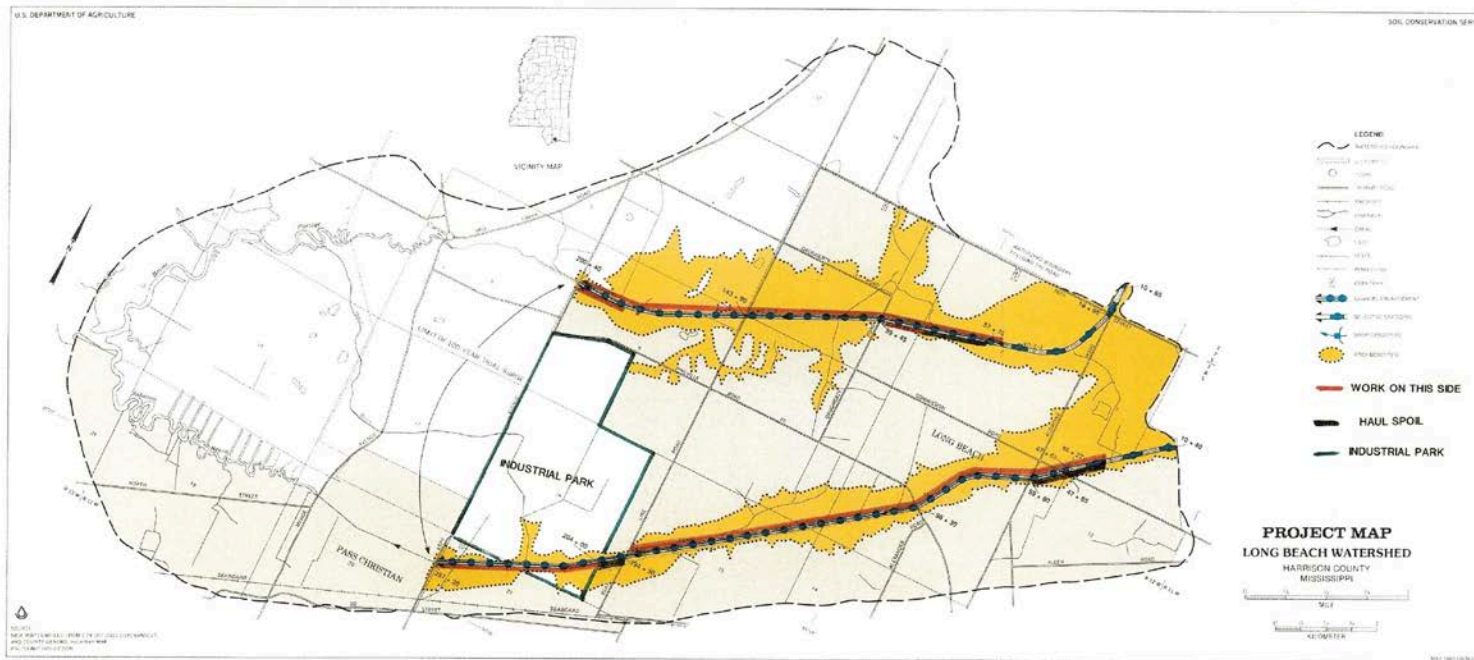
- **Bulletin Board** – Post up-to-date information on one or more bulletin boards at public facilities in the Long Beach area showing monthly project progress.
- **Public Meetings and Hearing** – Conduct a Public Hearing on the project in an open house format where attendees may review exhibits, discuss issues with project personnel, and provide written and verbal comments.







Long Beach Canal #1 Field Trip Itinerary – August 14, 2007 Scoping Meeting



## **Natural Environment Report**

**Natural Environment Report  
Canal No. 1 Channel Modifications  
Long Beach Water Management District  
Harrison County, Mississippi**

**January 2009**

**Prepared for:  
Neel-Schaffer, Inc.  
and  
Long Beach Water Management District**

**Prepared by:  
Environmental Research Group, LLC  
Centreville, Mississippi**

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**APPENDICIES**

Appendix A. Agency Response Letters  
Appendix B. State Protected Species List

## **1.0 INTRODUCTION**

### **1.1 Background**

Canal No. 1 is a man-made canal that was constructed in 1918 near the City of Long Beach in Harrison County, Mississippi. The 4.7 mile section of Canal No. 1 covered in this report begins near the U.S. Navy Construction Battalion Base and continues west to Espy Avenue (Figure 1).

An Environmental Impact Statement (EIS) was conducted in 1989, encompassing work on Canal No. 1, 2, and 3. The improvements to Canal No. 2 and 3 have been completed. A Supplemental EIS (SEIS) is being prepared to update the EIS prepared for Canal No. 1. The purpose of the SEIS will be to review and update current conditions of the study area and evaluate impacts associated with the proposed project. The proposed project is needed to reduce costs and impacts to families from flood damages.

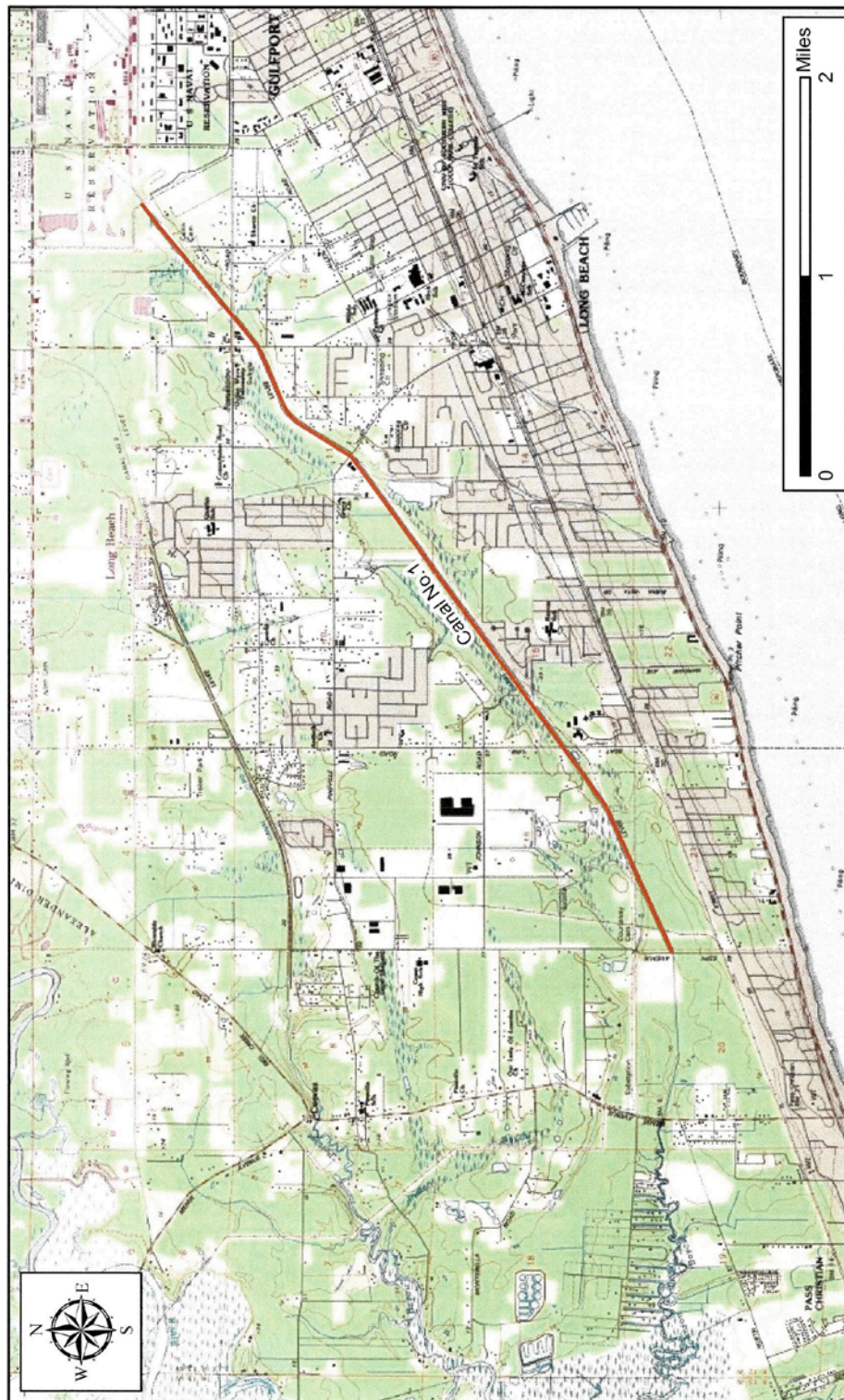
The Long Beach Water Management District (LBWMD) proposes to modify the existing canal through construction of channel modifications. These modifications include structural measures to enlarge portions of the existing channel and perform selective snagging along the remainder of the channel. The proposed project consists of 3.8 miles of channel enlargement of earth-lined channel and 0.2 miles of rock riprap lined channel. The earth-lined channel will have 3:1 side slopes and bottom widths ranging from 30 to 40 feet. The rock riprap-lined section is required due to limited right-of-way (ROW) width. Selective snagging will be performed along 0.7 miles to remove log jams, free or affixed logs, and rooted trees in danger of falling into the channel. The channel would be constructed with 3:1 side slopes to encourage establishment of vegetation. This vegetation would reduce bank erosion and improve sediment trapping. Also, sediment traps will be placed at the lower end of the channel to reduce downstream travel of sediment during and following construction.

### **1.2 Project Objective**

Environmental Research Group, LLC (ERG), a sub-consultant to Neel-Schaffer, Inc. (NSI), was tasked by the Long Beach Water Management District to provide a natural environment report within the proposed project area. This field survey included the flora and faunal communities of the surrounding area, threatened and endangered species in the project area, and the general water quality associated with Canal No. 1. Water quality is described in this report based on visual observation of the existing conditions. No samples were collected and no water quality testing was performed.



Figure 1. Canal No. 1 Channel Modification Study Area



1-2

Date: January 20, 2009

Environmental Research Group, LLC.

## 2.0 NATURAL ENVIRONMENT

### 2.1 Water Quality

The general water quality of Canal No. 1 was noted during the field survey on October 13-16, 2008. The existing channel is a murky brown color throughout the project area. Some areas of the canal are flowing while others are blocked because of beaver dams, woody debris, or from man-made ponds. Ditches connected to the canal were also murky colored. Anthropogenic trash and other debris occurred within the water that flows through this system.

Canal No. 1 flows into Johnson Bayou, which flows into the St. Louis Bay. Neither Canal No. 1 or Johnson Bayou are listed on Mississippi Department of Environmental Quality's (MDEQ) 305(b) Water Quality Report or the 303(d) List of Impaired Water Bodies (MDEQ 2009). There are no scenic streams in the project corridor. The nearest scenic stream is Wolf River (MDWFP 2009) which is approximately three miles northeast of Canal No. 1 and flows into the St. Louis Bay.

### 2.2 Wetlands and U.S. Jurisdictional Waters

ERG biologists conducted a preliminary wetland investigation with on-site inspections along 4.7 miles of Canal No. 1 and a 125-foot wide corridor on each side of the existing canal on October 13-16, 2008. A total of 4.74 acres of jurisdictional wetlands, 2.89 acres of ponds, and 5.26 miles of waters of the U.S. were identified within the project area.

The results of the surveys as well as the methods used are covered in a report titled Wetlands Technical Report, Canal No. 1 Channel Modifications, Long Beach Water Management District, Harrison County, Mississippi (ERG 2009). The USACE has the authority to make the final decision regarding the jurisdictional status of wetlands and waters of the U.S. The USACE should be contacted to verify these findings and to determine the appropriate permit requirements prior to the disturbance of any jurisdictional areas.

### 2.3 Floral Communities

The project area is located within the Outer Coastal Plain Mixed Forest Ecological Province (Rudis 1999). During the field survey on October 13-16, 2008, typical vegetation characteristics of the project area were recorded by ERG biologists. The information collected during field reconnaissance, along with the current aerial photography, was used to classify the project area into three vegetation communities. A description of the community types is included in the following paragraphs.

#### Mixed Forest

Upland areas are typically dominated by mature hardwoods with scattered pines throughout and a somewhat dense scrub/shrub layer. Dominant vegetation observed included water oak (*Quercus nigra*), loblolly pine (*Pinus taeda*), wax myrtle (*Myrica cerifera*), red maple (*Acer rubrum*), Chinese tallow (*Triadica sebifera*), blackberry (*Rubus louisianus*), and baccharis (*Baccharis halimifolia*).

#### Pasture

A maintained power line ROW that parallels Canal No. 1 supports pasture grasses. Dominant grasses observed in these areas consisted of little bluestem (*Schizachyrium scoparium*), bermudagrass (*Cynodon dactylon*), and goldenrod (*Solidago altissima*). Emergent wetlands



were identified within the project area along the power line ROW. Dominant vegetation included in these areas included common rush (*Juncus effuses*), sedges (*Carex* spp.), common spikerush (*Eleocharis palustris*), shortbristle horned beaked sedge (*Rhynchospora corniculata*), smartweed (*Polygonum hydropiperoides*), St. Johnswort (*Hypericum cistifolium*), Chinese tallow, titi (*Cyrilla racemiflora*), and switchcane (*Arundinaria gigantea*). On the edges of some of the wetlands were little bluestem, Johnsongrass (*Sorghum halepense*), panic grass (*Dichanthelium acuminatum*), water oak, magnolia bay (*Magnolia virginiana*), goldenrod, and dogfennel (*Eupatorium capillifolium*).

#### Rural/Developed

The rural community type consists of roadways, residences, and commercial businesses. Rural areas contain small areas of the upland mixed forest and pasture community types discussed above in addition to homes, barns, and other dwellings. This community type includes mowed residential lawns and decorative trees. Flora present in these areas includes native hardwood trees as well as ornamental trees, shrubs, and grasses.

## **2.4 Faunal Communities**

#### Aquatic Species

While the aquatic communities lend diversity to the area, their overall contribution to wildlife habitat is diminished due to the fact that Canal No. 1 is a man-made channel for the discharge of stormwater. Upstream of Menge Avenue, Canal No. 1 has little resemblance to a natural stream. Above the area of tidal influence, the canal has little flow during the dry periods of the year and has little value as a fishery resource. Canal No. 1 empties into Johnson Bayou which is part of the Bay of St. Louis estuary. This estuary supports important fisheries resources including spotted sea trout, redfish, brown and white shrimp, and blue crab (USDA 1989).

Observation of aquatic wildlife within the canal was difficult due to high water turbidity. In many areas, the water appeared tannic and aquatic animals could not be seen below the surface. No sampling for aquatic vertebrates or invertebrates was performed as part of the field surveys. Several of the larger drains and ponds had some small fish species, but no collection was made to determine species. Several frogs, turtles, and surface invertebrates (beetles, etc.) were seen during the field surveys.

#### Terrestrial Species

The project area is located within the Outer Coastal Plain Mixed Forest Ecological Province (Rudis 1999). Common fauna varies with the age and composition of timber stands, percent of deciduous trees, proximity to openings, and presence of bottomland forest types. The project site is inhabited by common fauna, including small mammals, reptiles and avian species. Whitetail deer (*Odocoileus virginianus*), raccoon (*Pryonon lotor*), fox (*Vulpes vulpes* and *Urocyon cinereoargenteus*), and cottontail rabbit (*Sylvilagus floridanus*) are common. The fox squirrel (*Sciurus niger*) is common when deciduous trees are present on uplands and gray squirrels (*Sciurus carolinensis*) occur along drainages.

Common bird species include the pine warbler (*Dendroica pinus*), cardinal (*Cardinalis cardinalis*), summer tanager (*Piranga rubra*), Carolina wren (*Thryothorus ludovicianus*), ruby-throated hummingbird (*Archilochus colubris*), blue jay (*Cyanocitta cristata*), eastern towhee (*Pipilo erythrophthalmus*), and tufted titmouse (*Baeolophus bicolor*).

Common forest snakes include the cottonmouth (*Agkistrodon piscivorus*), copperhead (*Agkistrodon contortrix*), rough green snake (*Opheodrys aestivus*), rat snake (*Elaphe obsoleta*),

coachwhip (*Masticophis flagellum*), and the speckled kingsnake (*Lampropeltis getula*). Fence lizards (*Sceloporus* sp.) and glass lizards (*Ophisaurus* sp.) are also common.

Wildlife within the project area is highly influenced by the existing roadways and regional development of the area. Wildlife use of these areas includes permanent inhabitation, seasonal inhabitation, migratory routes, temporary shelter, or foraging. Due to its constant source of water, Canal No. 1 and the drains that flow into it are important to the wide variety of wildlife.

## **2.5 Threatened and Endangered Species**

### **2.5.1 Background**

The Endangered Species Act (ESA) [16 U.S.C. 1531 et. seq.] of 1973, as amended, was enacted to provide a program for the preservation of endangered and threatened species and to provide protection for the ecosystems upon which these species depend for their survival. All federal agencies or projects utilizing federal funding are required to implement protection programs for designated species and to use their authorities to further the purposes of the act. Responsibility for the identification of a threatened or endangered species and development of any potential recovery plan lies with the Secretary of the Interior and the Secretary of Commerce.

The United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) are the primary agencies responsible for implementing the ESA. The USFWS is responsible for birds and terrestrial and freshwater species, while the NMFS is responsible for non-bird marine species. The responsibilities of these agencies under the ESA include: (1) the identification of threatened and endangered species; (2) the identification of critical habitats for listed species; (3) implementation of research on, and recovery efforts for, these species; and (4) consultation with other federal agencies concerning measures to avoid harm to listed species.

An endangered species is a species in danger of extinction throughout all or a significant portion of its range. A threatened species is a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Species may be considered endangered or threatened when any of the five following criteria occurs: (1) The current/imminent destruction, modification, or curtailment of their habitat or range; (2) Overuse of the species for commercial, recreational, scientific, or educational purposes; (3) Disease or predation; (4) The inadequacy of existing regulatory mechanisms; and (5) Other natural or human-induced factors affect continued existence. Delisted species have been removed from the list of endangered and threatened wildlife and plants; however, these species are monitored by the states for no less than five years and/or are protected by other federal regulations.

### **2.5.2 Federal and State Protected Species**

#### Federal Species

The USFWS lists 15 species of plants and animals that are Threatened or Endangered in Harrison County (USFWS 2008) (Table 1). It should also be noted that the bald eagle (*Haliaeetus leucocephalus*) is currently protected statewide under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

**Table 1.**  
**List of Federally Protected Species in Harrison County, Mississippi**

Common Name	Scientific Name	Federal Status	Year Listed	Habitat Descriptions
Alabama red-bellied turtle	<i>Pseudemys alabamensis</i>	E	1987	Shallow vegetated streams, rivers, or backwaters
black pine snake	<i>Pituophis melanoleucus lodingi</i>	C	N/A	Sandy, well-drained soils; open pine forests, moderate to sparse midstory; and a well-developed herbaceous understory dominated by grasses
brown pelican	<i>Pelecanus occidentalis</i>	E	1970	Coastal waters no more than 20 miles out to sea
gopher tortoise	<i>Gopherus polyphemus</i>	T	1987	Deep sand ridges which originally supported longleaf pine and patches of scrub oak
green turtle	<i>Chelonia mydas</i>	T	1978	Coastal waters
gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	T	1991	Salt waters into large coastal rivers to spawn
Kemp's ridley	<i>Lepidochelys kempii</i>	E	1970	Coastal waters
leatherback turtle	<i>Dermochelys coriacea</i>	E	1970	Coastal waters
loggerhead turtle	<i>Caretta caretta</i>	T	1978	Coastal waters
Louisiana black bear	<i>Ursus americanus luteolus</i>	T	1992	Bottomland hardwoods
Louisiana quillwort	<i>Isoetes louisianensis</i>	E	1992	Sandy soils and gravel bars in or near shallow blackwater streams and overflow channels in riparian woodland/bayhead forests of pine flatwoods and upland longleaf pine
Mississippi gopher frog	<i>Rana capito sevosa</i>	E	2001	upland sandy habitats historically forested with longleaf pine and isolated temporary wetland breeding sites
pipin plover	<i>Charadrius melodus</i>	T	1986	Coastal beaches
red-cockaded woodpecker	<i>Picoides borealis</i>	E	1970	Open, mature and old-growth pine ecosystems of the Southeastern U.S.
West Indian manatee	<i>Trichechus manatus</i>	E	1967	Large, slow-moving rivers, river mouths, and shallow coastal areas such as coves and bays

E = Endangered  
T = Threatened  
C = Candidate for listing

Source: USFWS 2008



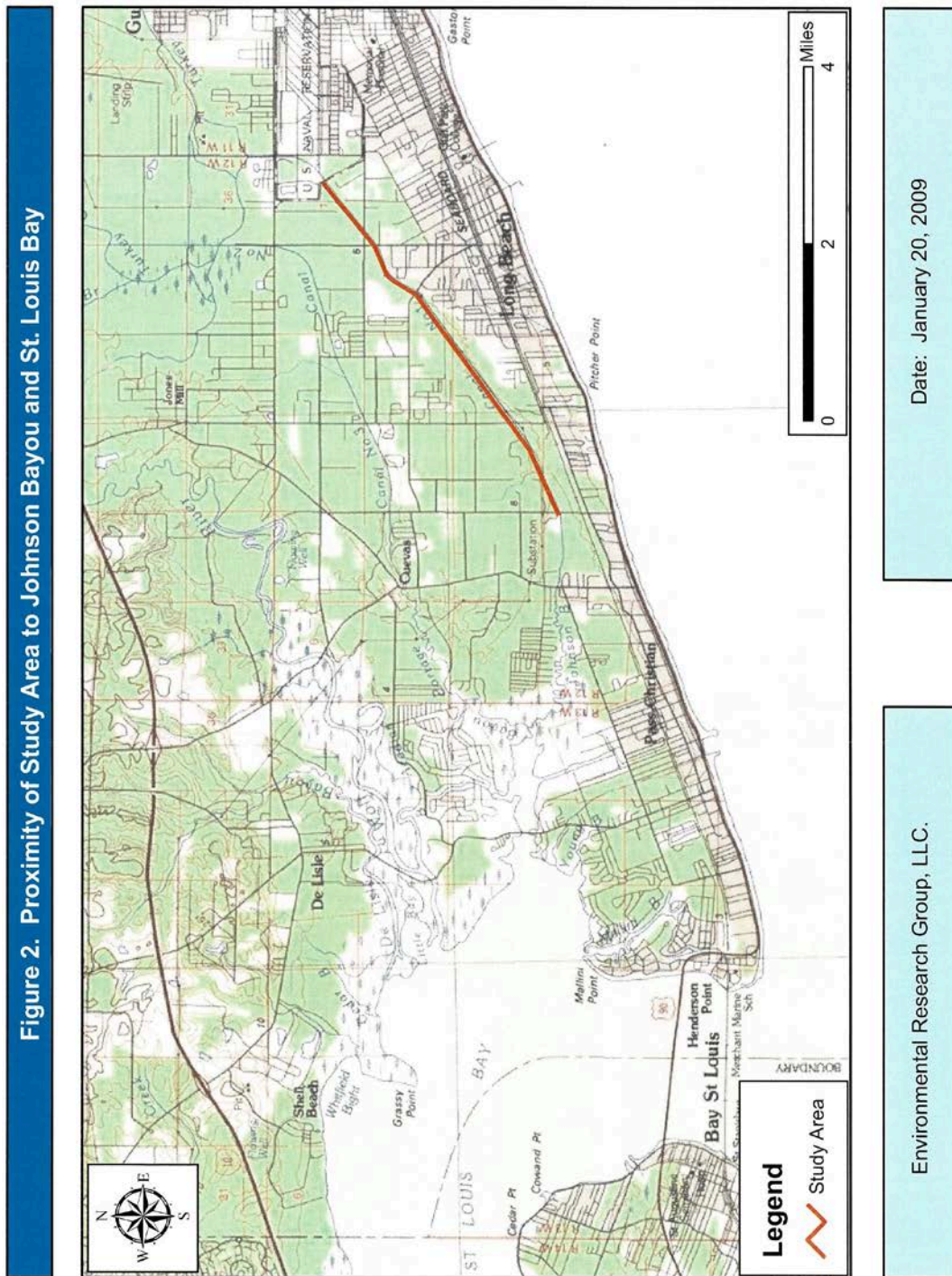
The USFWS has designated critical habitat for the gulf sturgeon and piping plover; however, no critical habitat is located within the project area or within the immediate vicinity of the project area. None of the species identified in Table 1 were observed during field surveys. However, potential habitat may exist near the project area or downstream of the project area. Potential impacts to these species should be analyzed in detail in the SEIS.

Solicitation letters were submitted to the Mississippi Natural Heritage Program (MNHP), USFWS, and the Mississippi Department of Marine Resources (MDMR) prior to commencement of this report. A letter was received from the MNHP dated December 4, 2008 which expressed concern regarding the project nature and how channel modifications can affect sensitive habitats such as marshes and tidal streams. The MNHP recommends that perpetual easements, parcels of wetlands or land that could be restored to wetlands along either side of the canal, be put into place to contain increased stormwater capacities. This measure would help compensate for the potential increased floodwater capacity, slow water velocity, prevent downstream erosion, and act as a filtration system before storm water enters the canal (Appendix A).

A letter was received from the MDMR dated December 18, 2008 which stated that although the proposed project area would not directly impact tidal systems, indirect impacts to tidal and tidally influenced waters and wetlands located further downstream are possible. This letter also stated that the SEIS should contain anticipated impacts to tidal and non-tidal areas downstream from the proposed project area. Enclosed with their letter, the MDMR sent a Joint Application form that should be submitted to their office for review and determination of Coastal Zone Consistency (CZC) for the proposed project (Appendix A).

#### State Species

The MNHP maintains a list of state protected species. This list includes species whose occurrence in Mississippi is or may be in jeopardy, or with known or perceived threats or population declines. These species are not necessarily the same as those protected under the ESA. Currently, there are 106 species listed by the State of Mississippi for Harrison County consisting of 45 animals and 61 plants (MNHP 2008) (Appendix B). The MNHP letter indicated that documented occurrences of the following species were found in St. Louis Bay, Bayou Portage, and their surrounding tributaries and marshes: Manatee (*Trichechus manatus*); Saltmarsh Topminnow (*Fundulus jenkinsi*); Mississippi Diamondback Terrapin (*Malaclemys terrapin pileata*); Gulf Salt Marsh snake (*Nerodia clarkii clarkii*), and Least Killifish (*Heterandria formosa*). Canal No. 1 flows into Johnson Bayou, which eventually connects to the St. Louis Bay (Figure 2). Impacts to the above listed species associated with the proposed project should be analyzed in the SEIS.



2-6

### 3.0 SUMMARY/RECOMMENDATIONS

Field surveys were conducted by ERG biologists on October 13-16, 2008. All areas of potential habitat, including all stream crossings, were surveyed to determine the presence or absence of protected species. No federally listed or state listed species were observed; however, potential habitat may exist near or downstream of the proposed project area. In addition, the MNHP has documented occurrences of the manatee, saltmarsh topminnow, Mississippi diamondback terrapin, Gulf salt marsh snake, and least killifish downstream of the proposed project. Impacts to both federal and state species should be analyzed in detail in the SEIS.

The water quality of Canal No. 1 is consistently turbid and a murky brown color. Some areas of the canal have flowing water while other areas are blocked. None of the water features within the proposed project area are listed on the state water quality reports (MDEQ 2008).

A total of 4.74 acres of jurisdictional wetlands, 2.89 acres of ponds, and 5.26 miles of waters of the U.S. were identified within the project area. A separate wetlands technical report, Wetlands Technical Report, Canal No. 1 Channel Modifications, Long Beach Water Management District, Harrison County, Mississippi (ERG 2009), has been written to detail the findings. The USACE has the authority to make the final decision regarding the jurisdictional status of wetlands and waters of the U.S. The USACE should be contacted to verify these finding and to determine the appropriate permit requirements prior to the disturbance of any jurisdictional areas.

Any impacts to the flora or fauna in the project area as a result of the modification of Canal No. 1 should be minor and temporary. Recommendations from the Mississippi Natural Heritage Program and the Mississippi Department of Marine Resources to minimize indirect impacts downstream from the proposed project area should be considered during the SEIS process.



#### 4.0 REFERENCES

- Environmental Research Group, LLC (ERG). 2009. *Wetlands Technical Report, Canal No. 1 Channel Modifications, Long Beach Water Management District, Harrison County, Mississippi*.
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- U.S. Department of Agriculture (USDA). 1975. Soil Survey of Harrison County, Mississippi. Prepared by the Natural Resources Conservation Service.
- U.S. Fish and Wildlife Service (USFWS). 2008. List of Threatened and Endangered Species by County. Internet Website: <http://www.fws.gov/southeast/jackson/SpeciesbyCounty.pdf>

## **State Protected Species List**

Scientific Name	Common Name	State Rank	Federal Status
<i>Accipiter striatus</i>	Sharp-shinned hawk	S1?B,SZN	
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	S1	T
<i>Aimophila aestivalis</i>	Bachman's sparrow	S3?B,SZN	
<i>Anas fulvigula</i>	Mottled duck	S3B,S4N	
<i>Caretta caretta</i>	Loggerhead	S1B,SZN	T
<i>Chardrius melodus</i>	Piping plover	SZN	T
<i>Coturnicops noveboracensis</i>	Yellow rail	S2N	
<i>Drymarchon corais couperi</i>	Eastern indigo snake	S1	
<i>Egretta rufescens</i>	Reddish egret	SZN	
<i>Enneacanthus gloriosus</i>	Bluespotted sunfish	S3	
<i>Falco columbarius</i>	Merlin	SZN	
<i>Fallicambarus byersi</i>	Lavender burrowing crayfish	S3	
<i>Fallicambarus danielae</i>	Speckled burrowing crayfish	S2	
<i>Fundulus jenkinsi</i>	Saltmarsh topminnow	S3	
<i>Gopherus polyphemus</i>	Gopher tortoise	S2	T
<i>Grus canadensis pulla</i>	Mississippi sandhill crane	S1	
<i>Haematopus palliatus</i>	American oystercatcher	SPB,SZN	
<i>Haliaeetus leucocephalus</i>	Bald eagle	S1B,S2N	DL
<i>Heterandria formosa</i>	Least killifish	S3	
<i>Heterodon simus</i>	Southern hognose snake	SH	
<i>Laterallus jamaicensis</i>	Black rail	S2N	
<i>Lepidochelys kempi</i>	Kemp's ridley	S1N	E
<i>Macrochelys temminckii</i>	Alligator snapping turtle	S3	
<i>Malaclemys terrapin pileata</i>	Mississippi diamondback terrapin	S2	
<i>Nerodia clarkii clarkii</i>	Gulf salt marsh snake	S2?	
<i>Notropis chalybaeus</i>	ironcolor shiner	S2	
<i>Nycticorax nycticorax</i>	Black-crowned night heron	S3?B,SZN	
<i>Onthophagus polyphemi</i>	tortoise commensal scarab beetle	S?	
<i>Pandion haliaetus</i>	Osprey	S3B,SZN	
<i>Pelecanus erythrorhynchos</i>	American white pelican	S2N	
<i>Pelecanus occidentalis</i>	Brown pelican	S1N	E
<i>Peromyscus polionotus</i>	Oldfield mouse	S2S3	
<i>Picoides borealis</i>	Red-cockaded woodpecker	S1	E
<i>Pituophis melanoleucus lodingi</i>	Black pine snake	S2	C
<i>Procambarus fitzpatricki</i>	Spiny tailed crayfish	S2	
<i>Pseudemys sp.</i>	Mississippi redbelly turtle	S1	
<i>Pseudotriton montanus</i>	Mud salamander	S2S3	
<i>Rana heckscheri</i>	River frog	S1	
<i>Rana sevosia</i>	Dark gopher frog	S1	
<i>Regina rigida sinicola</i>	Gulf crayfish snake	S3?	
<i>Rhadinaea flavilata</i>	Pine woods snake	S3?	
<i>Sterna antillarum</i>	Least tern	S3B,SZN	
<i>Sterna maxima</i>	Royal tern	S1B,S4N	
<i>Thryomanes bewickii</i>	Bewick's wren	S2S3B,SZN	
<i>Trichechus manatus</i>	Manatee	SZ	
<i>Agalinis aphylla</i>	Coastal plain false-foxglove	S2S3	
<i>Agalinis filicaulis</i>	Thin stemmed false-foxglove	S2?	
<i>Agrimonia incisa</i>	Incised groovebur	S3S4	
<i>Andropogon perangustatus</i>	Elliott's bluestem (Var.2)	S1?	

Scientific Name	Common Name	State Rank	Federal Status
<i>Aristida condensata</i>	Sandhills three awn	S3S4	
<i>Avicennia nitida</i>	Black mangrove	SH	
<i>Burmannia biflora</i>	Northern burmannia	S3S4	
<i>Calopogon barbatus</i>	Bearded grass-pink	S2S3	
<i>Carex exilis</i>	Coast sedge	S2	
<i>Chamaecrista deeringiana</i>	Florida senna	S1	
<i>Cleistes divaricata</i>	Spreading pogonia	S3	
<i>Coreopsis basalis</i>	Golden-mane tickseed	S1?	
<i>Dichantheium erectifolium</i>	Erect-leaf witchgrass	S3S4	
<i>Elyonurus tripsacoides</i>	Pan american balsamscale	SH	
<i>Epidendrum conopseum</i>	Green-fly orchid	S2	
<i>Eriocaulon texense</i>	Texas pipewort	S2S3	
<i>Gaylussacia frondosa</i>	Dangleberry	S2S3	
<i>Helianthemum arenicola</i>	Gulf rockrose	S1S2	
<i>Ilex amelanchier</i>	Juneberry holly	S3	
<i>Ilex cassine</i>	Dahoon holly	S2	
<i>Ilex myrtifolia</i>	Myrtle holly	S3S4	
<i>Ipomoea pes-caprae</i>	Railroad vine	S2S3	
<i>Isoetes louisianensis</i>	Louisiana quillwort	S2	E
<i>Juniperus silicicola</i>	Southern red cedar	S2	
<i>Lachnocaulon digynum</i>	Pineland bogbutton	S2	
<i>Lilaeopsis carolinensis</i>	Carolina lilaeopsis	S2S3	
<i>Lindera subcoriacea</i>	Bog spice bush	S2	
<i>Linum macrocarpum</i>	Large fruited flax	S2	
<i>Lycopodium cernuum</i>	Nodding clubmoss	S2	
<i>Macranthera flammea</i>	Flame flower	S3?	
<i>Melanthium virginicum</i>	Virginia bunchflower	S2S3	
<i>Mikania cordifolia</i>	Florida keys hempvine	S3S4	
<i>Panicum nudicaule</i>	Naked-stemmed panic grass	S2	
<i>Paronychia erecta</i>	Beach sand-squares	S1S2	
<i>Paspalum monostachyum</i>	Gulfdune paspalum	SU	
<i>Peltandra sagittifolia</i>	White arum	S2S3	
<i>Petalostemon gracilis</i>	Pine barrens prairie clover	S2S3	
<i>Physalis angustifolia</i>	Coast ground-cherry	S3S4	
<i>Pinguicula planifolia</i>	Chapman's butterwort	S2	
<i>Pinguicula primuliflora</i>	Southern butterwort	S3	
<i>Plantanthera blephariglottis</i>	Large white fringed orchid	S2	
<i>Plantanthera cristata</i>	Crested gringed orchid	S3	
<i>Plantanthera integra</i>	Yellow fringeless orchid	S3S4	
<i>Polanisia tenuifolia</i>	Slender-leaf clammy-weed	S1S2	
<i>Polygala hookeri</i>	Hooker's milkwort	S1S2	
<i>Quercus myrtifolia</i>	Myrtle-leaf oak	S1?	
<i>Rhynchospora macra</i>	Large beakrush	S3	
<i>Rhynchospora stenophylla</i>	Chapman beakrush	S1?	
<i>Ruellia noctiflora</i>	Night-flowering ruellia	S2	
<i>Ruellia pedunculata</i> spp <i>pinetorum</i>	Pine barren ruellia	S3	
<i>Sarracenia leucophylla</i>	Crimson pitcher-plant	S2S3	
<i>Sorghastrum apalachicolense</i>	Open indian grass	S3	
<i>Spiranthes longilabris</i>	Giant spiral ladies'-tresses	S2S3	



Scientific Name	Common Name	State Rank	Federal Status
<i>Stewartia malacodendron</i>	Silky camellia	S3S4	
<i>Stylisma aquatica</i>	Water southern morning-glory	S1	
<i>Syngonanthus flavidulus</i>	Yellow pipewort	S2?	
<i>Utricularia purpurea</i>	Purple bladderwort	S2S3	
<i>Xyris chapmanii</i>	Chapman's yellow-eyed grass	S2?	
<i>Xyris drummondii</i>	Drummond's yellow-eyed grass	S2	
<i>Xyris flabelliformis</i>	Fan-shaped yellow-eyed grass	SU	
<i>Xyris scabrifolia</i>	Harper's yellow-eyed grass	S1S2	

Source: MNHP 2008

- S1** — Critically imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.
- S2** — Imperiled in Mississippi because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.
- S3** — Rare or uncommon in Mississippi (on the order of 21 to 100 occurrences).
- S4** — Widespread, abundant, and apparently secure in the state, but with cause for long-term concern (more than 101 occurrences).
- S5** — Demonstrably widespread, abundant, and secure in the state.
- SH** — Of historical occurrence in Mississippi, perhaps not verified in the past 20 years, and suspected to be extant. An element would also be ranked SH if the only known occurrence(s) were destroyed, or if it had been sought extensively and unsuccessfully looked for. Upon verification of an extant occurrence, SH ranked elements would typically receive an S1 rank.
- SR** — Reported from the state, but without persuasive documentation which would provide a basis for either accepting or rejecting the report.
- SU** — Possibly in peril in Mississippi but status uncertain; need more information. May also be represented by S?
- S?** — Unranked: Element is not yet ranked in the state.
- SX** — Element is believed to be extirpated from the state.
- SE** — Exotic: An exotic established in the state; may be native in nearby regions (e.g. pecans along the eastern seaboard of the U.S.)
- SA** — Accidental: accidental or casual in the state (i.e., infrequent and far outside usual range).
- SZ** — Zero occurrences in the state. Not of practical conservation concern in the state, because there are no definable occurrences, although the taxon is native and appears regularly in the state.
- SP** — Potential: Element potentially occurs in the state but no occurrences reported.
- SR** — Reported: Element reported in the state but without persuasive demonstration which would provide a basis for either accepting or rejecting (e.g. misidentified specimen) the report.
- SRF** — Reported falsely: Element erroneously reported in the state and the error has persisted in the literature.
- HYB** — Hybrid: Element represents hybrid of species.
- SSYN** — Synonym
- ?** — Inexact
- C** — Captive or Cultivated

Breeding Status: (Applicable to migratory species, mainly birds, but also includes sea turtles, some fish, and some insects).

- B** — Breeding Status  
**N** — Non-breeding Status

## **Wetlands Technical Report**

# **FINAL WETLANDS TECHNICAL REPORT**

## **CANAL NO. 1 CHANNEL MODIFICATIONS LONG BEACH WATER MANAGEMENT DISTRICT HARRISON COUNTY, MISSISSIPPI**

**April 2009**



Prepared By:

***ERG***

*Environmental Research Group, LLC*



**FINAL**  
**Wetlands Technical Report**  
**Canal No. 1 Channel Modifications**  
**Long Beach Water Management District**  
**Harrison County, Mississippi**

**April 2009**

**Prepared for:**  
**Neel-Schaffer, Inc.**  
**and**  
**Long Beach Water Management District**

**Prepared by:**  
**Environmental Research Group, LLC**  
**Centreville, Mississippi**

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- APPENDIX A. Photographs of the Project Area
- APPENDIX B. Plant Species Observed
- APPENDIX C. Data Sheets

**ACRONYMS/ABBREVIATIONS**

EIS	Environmental Impact Statement
ERG	Environmental Research Group, LLC
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GIS	Geographic Information System
GPS	Global Positioning System
LBWMD	Long Beach Water Management District
NSI	Neel-Schaffer, Inc.
NRCS	Natural Resources Conservation Service
OBL	Obligate Wetland
PEM	Palustrine Emergent
PFO	Palustrine Forested
POW	Palustrine Open Water
PSS	Palustrine Scrub Shrub
ROW	Right-of-Way
SEIS	Supplemental Environmental Impact Statement
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
UPL	Upland

## **1.0 INTRODUCTION**

### **1.1 Background**

Canal No. 1 is a man-made canal that was constructed in 1918 near Long Beach in Harrison County, Mississippi. The 4.7 mile section of Canal No. 1 proposed to be modified begins near the U.S. Navy Construction Battalion Base and continues west to Espy Avenue (Figure 1).

An Environmental Impact Statement (EIS) was conducted in 1989, encompassing work on Canal No. 1, Canal No. 2, and Canal No. 3. The improvements to Canal No. 2 and 3 have been completed. A Supplemental EIS (SEIS) is being prepared to update the EIS work previously prepared for Canal No. 1. The proposed project is needed to reduce costs and impacts to families from flood damages. The purpose of the SEIS will be to review and update current conditions of the study area and evaluate impacts from the proposed project.

The Long Beach Water Management District (LBWMD) proposes to modify the existing canal through construction of channel modifications. These modifications include structural measures to enlarge portions of the existing channel and perform selective snagging along the remainder of the channel. The proposed project consists of 3.8 miles of channel enlargement of earth-lined channel and 0.2 miles of rock riprap lined channel. The earth-lined channel will have 3 to 1 side slopes and bottom widths ranging from 30 to 40 feet. The rock riprap-lined reach is planned due to limited right-of-way (ROW) widths. Selective snagging will be performed along 0.7 miles of Canal No. 1 to remove log jams, free or affixed logs, and rooted trees in danger of falling into the channel. Hardwood species would be planted in the ROW areas along the canal and within the Long Beach Industrial Park. The channel would be constructed with 3:1 side slopes to encourage establishment of vegetation. This vegetation would reduce bank erosion and improve sediment trapping. Also, sediment traps will be placed at the lower end of the channel to reduce downstream travel of sediment during and following construction.

### **1.2 Project Objective**

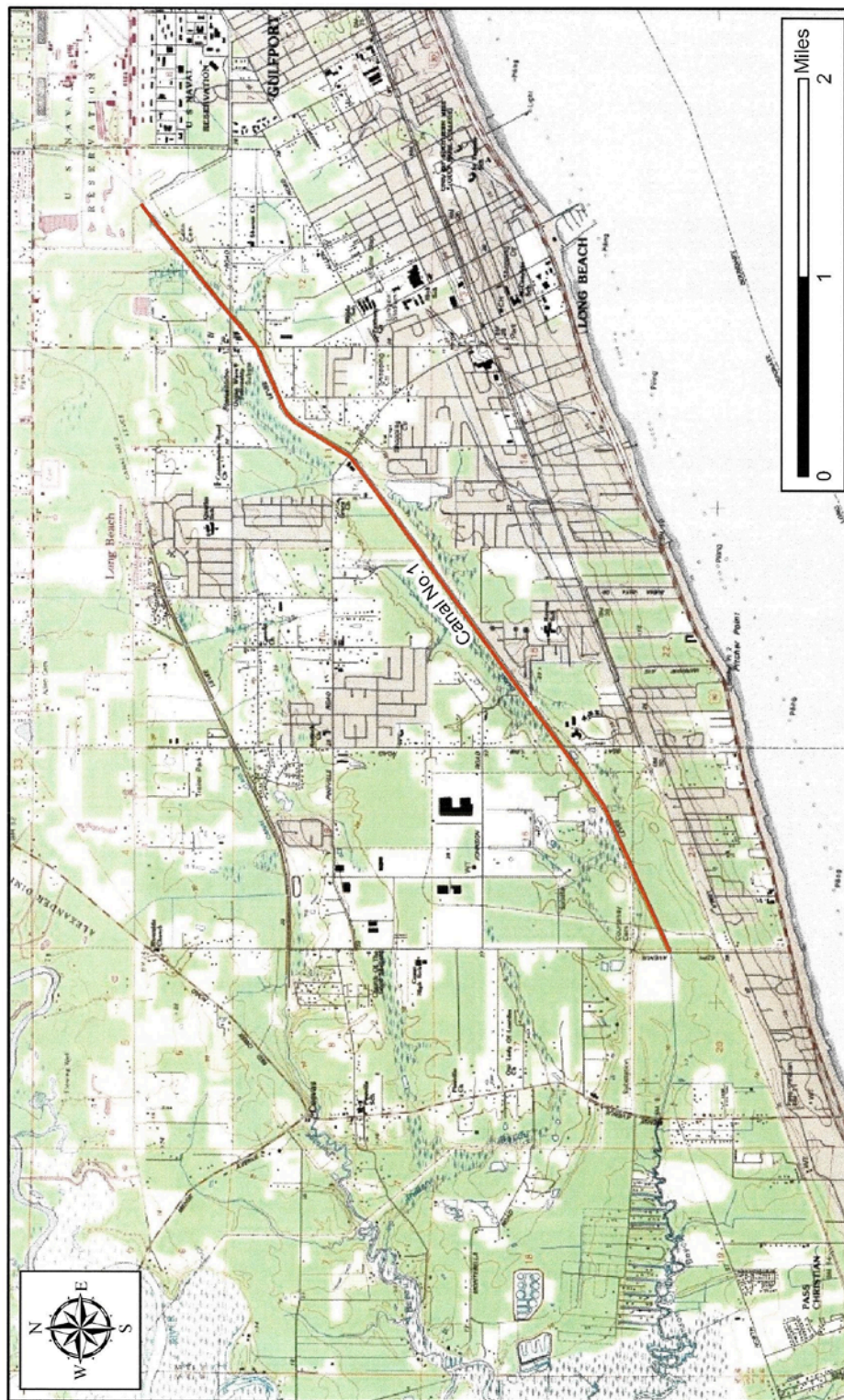
Environmental Research Group, LLC (ERG), a sub-consultant to Neel-Schaffer, Inc. (NSI), was tasked by the Long Beach Water Management District to provide a delineation of the jurisdictional wetlands and waters of the U.S. within the proposed project area.

### **1.3 Clean Water Act**

The objective of the Clean Water Act is to maintain and restore the chemical, physical, and biological integrity of the waters of the U.S. Section 404 of the Clean Water Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into waters of the U.S., including deepwater habitats, special aquatic sites, and wetlands. The U.S. Army Corps of Engineers (USACE) has the authority to make decisions regarding the jurisdictional status of a wetland. Therefore, the USACE should be contacted prior to disturbance of any area investigated during this preliminary effort.



Figure 1. Canal No. 1 Channel Modification Study Area



1-2

Date: January 20, 2009

Environmental Research Group, LLC.

Potential jurisdictional wetlands were investigated utilizing the three-parameter approach for a routine on site determination as defined by the USACE (Environmental Laboratory 1987).

The USACE defines wetlands as:

*Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.*

In order for an area to be considered a jurisdictional wetland by the USACE, it must have evidence of hydrophytic vegetation, hydric soils, and wetland hydrology. Under normal circumstances (site not altered in the last 5 years), the absence of any one of these three parameters results in a non-wetland determination. If disturbed conditions are present, then consideration must be given to what conditions would have been present had the disturbance not occurred.

#### **1.4 Interim Regional Supplement**

On December 17, 2008 the USACE announced by public notice the publication and one-year trial implementation period of the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region to the 1987 Wetland Delineations Manual. This supplement provides technical guidance and procedures for identifying and delineating wetlands that may be subject to regulatory jurisdiction under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act. Thirty days after the public notice, the Supplemental data forms and indicators must be used for any data collection for wetland delineations. The Atlantic and Gulf Coastal Plain Region consists of all or portions of the District of Columbia and the following states: Alabama, Arkansas, Delaware, Florida, Georgia, Illinois, Kentucky, Louisiana, Maryland, Mississippi, Missouri, New Jersey, North Carolina, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, and Virginia (Environmental Laboratory, 2008).

Since the field effort for this project was collected prior to this notice using the 1987 Manual, and has not yet been submitted to the Corps it will be grandfathered. Documentation must be submitted to the Corps which shows the field data was collected prior the 30 days for the date of the public notice in order to qualify for the grandfather provision. Once documentation and field data have been reviewed and approved by the Corps, a written determination will be issued (USACE 2008).



## 2.0 METHODS

ERG biologists conducted a preliminary investigation with on-site inspections along 4.7 miles of Canal No. 1 and a 125-foot wide corridor on each side of the existing canal on October 13-16, 2008. The limits of the wetlands and waters of the U.S. identified in this report were mapped using a Trimble GeoXH global positioning system (GPS) unit and the data was input into a geographic information system (GIS) program for analysis. Photographs of the project area are located in Appendix A, plant species observed are located in Appendix B, and data sheets of the wetlands are located in Appendix C.

An ERG biologist met with Mr. John McFadden of the USACE, Mobile District on March 23, 2009 to verify our findings. Mr. McFadden recommended a couple of changes to the original delineation. ERG biologists revisited the proposed project area on April 22, 2009 to evaluate the USACE recommendations. Changes were made and have been incorporated in this report.

Plant communities and dominant plant species were identified to determine the presence of hydrophytic vegetation. The National List of Plant Species that Occur in Wetlands (Reed 1988) was used to determine the indicator status of dominant plant species. Plants were classified as obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), or upland (UPL) species. Hydrophytic vegetation is prevalent in an area when the dominant species comprising the plant community or communities are typically adapted for life in saturated soil conditions (Environmental Laboratory 1987).

Wetland hydrology was determined by on-site visual observation of geomorphic and hydrologic characteristics including inundation, saturation, water marks, drift lines, drainage patterns, oxidized root channels, and water stained leaves. Additionally, soil pits were dug to determine if soil saturation was present in non-inundated areas at the time of the survey.

Soil profiles were examined for hydric soil indicators to determine if hydric soils were present. Additional soils information was taken from the Soil Survey of Harrison County, Mississippi (U.S. Department of Agriculture 1975). A list of hydric soils in the area was obtained from the local Natural Resources Conservation Service (NRCS) office.



### 3.0 RESULTS

ERG Biologists conducted a field investigation on October 13-16, 2008. The study area included 4.7 miles of the existing canal and a 125-foot wide corridor on each side of the existing canal.

#### 3.1 Vegetation

Vegetational characteristics of the proposed project area vary according to landscape position. The undeveloped areas include upland mixed forest or maintained pasture. Vegetation near the canal is typically mature upland hardwood/pine forest with a dense shrub layer. The study area has many downed trees most likely a result of Hurricane Katrina. Paralleling the canal is a maintained electrical power line right-of-way (ROW) that consists of herbaceous species.

Vegetation along the canal is characterized by a community dominated by mature upland hardwoods with scattered pines and a dense shrub layer. This community consists of mature and immature water oak (*Quercus nigra*), willow oak (*Quercus phellos*), southern red oak (*Quercus falcata*), sweetgum (*Liquidambar styraciflua*), live oak (*Quercus virginiana*), magnolia bay (*Magnolia virginiana*), Chinese tallow (*Triadica sebifera*), red maple (*Acer rubrum*), persimmon (*Diospyros virginiana*), blackgum (*Nyssa sylvatica*), loblolly pine (*Pinus taeda*), and black willow (*Salix nigra*). Chinese privet (*Ligustrum sinense*) and devils walking stick (*Aralia spinosa*) exist throughout the shrub layer, and peppervine (*Ampelopsis arborea*), roundleaf greenbrier (*Smilax rotundifolia*) and blackberry (*Rubus* spp.) are common vines mixed throughout.

Common rush (*Juncus effusus*), smartweed (*Polygonum* spp.), bushy bluestem (*Andropogon glomeratus*), eastern baccharis (*Baccharis halimifolia*), titi (*Cyrilla racemiflora*), beaked rush (*Rhynchospora corniculata*), and St. Johnswort (*Hypericum cistifolium*), Alligator weed (*Alternanthera philoxeroides*), and arrowhead (*Sagittaria* sp.) are commonly found along the edge of the canal and in wetland areas.

Vasey's grass (*Paspalum urvillei*), dallisgrass (*Paspalum dilatatum*), dogfennel (*Eupatorium capillifolium*), goldenrod (*Solidago altissima*), giant goldenrod (*Solidago gigantea*), pokeweed (*Phytolacca americana*), cogon grass (*Imperata cylindrica*), wax myrtle (*Morella cerifera*), little bluestem (*Schizachyrium scoparium*), and Bermuda grass (*Cynodon dactylon*) were noted within the power line ROW and in maintained pastures.

Sample Plots A, B, C, D, E, and U1 support hydrophytic vegetation (Appendix C). Hydrophytic vegetation is prevalent when more than 50 percent of the dominant species at a sample plot are OBL, FACW, or FAC.

#### 3.2 Soils

The NRCS Soil Survey for Harrison County was reviewed to determine general soil types found within the proposed alignment (USDA 1975). A list of hydric soils in the area was obtained from the local Natural Resources Conservation Service (NRCS) office. Hydric soils within the corridor include: Atmore silt loam (At), Hyde silt loam (Hy), Plummer loamy sand (Pm), and Ponzer and Smithton soils (Pa). A hydric soil is defined as a soil that is formed under conditions of saturation, flooding, or ponding long enough

during the growing season to develop anaerobic conditions in the upper part (Environmental Laboratory, 1987). Low-chroma color, an indicator of hydric soils, was observed at all Sample Plots.

### 3.3 Hydrology

Hydrology throughout the project corridor has been influenced by residential and commercial development resulting in localized modifications to drainage patterns. Hydrology indicators observed in the project corridor included inundation, saturation in the upper twelve inches, drainage patterns in wetlands, oxidized root channels in the upper 12 inches, and water-stained leaves. Sample Plots A, B, C, D, and E showed indications of hydrology. Indicators observed included inundation, saturation in the upper 12 inches, drainage patterns, sediment deposits, water-stained leaves, and oxidized root channels in the upper 12 inches. Plots U1 and U2 showed no indications of hydrology (Appendix C).

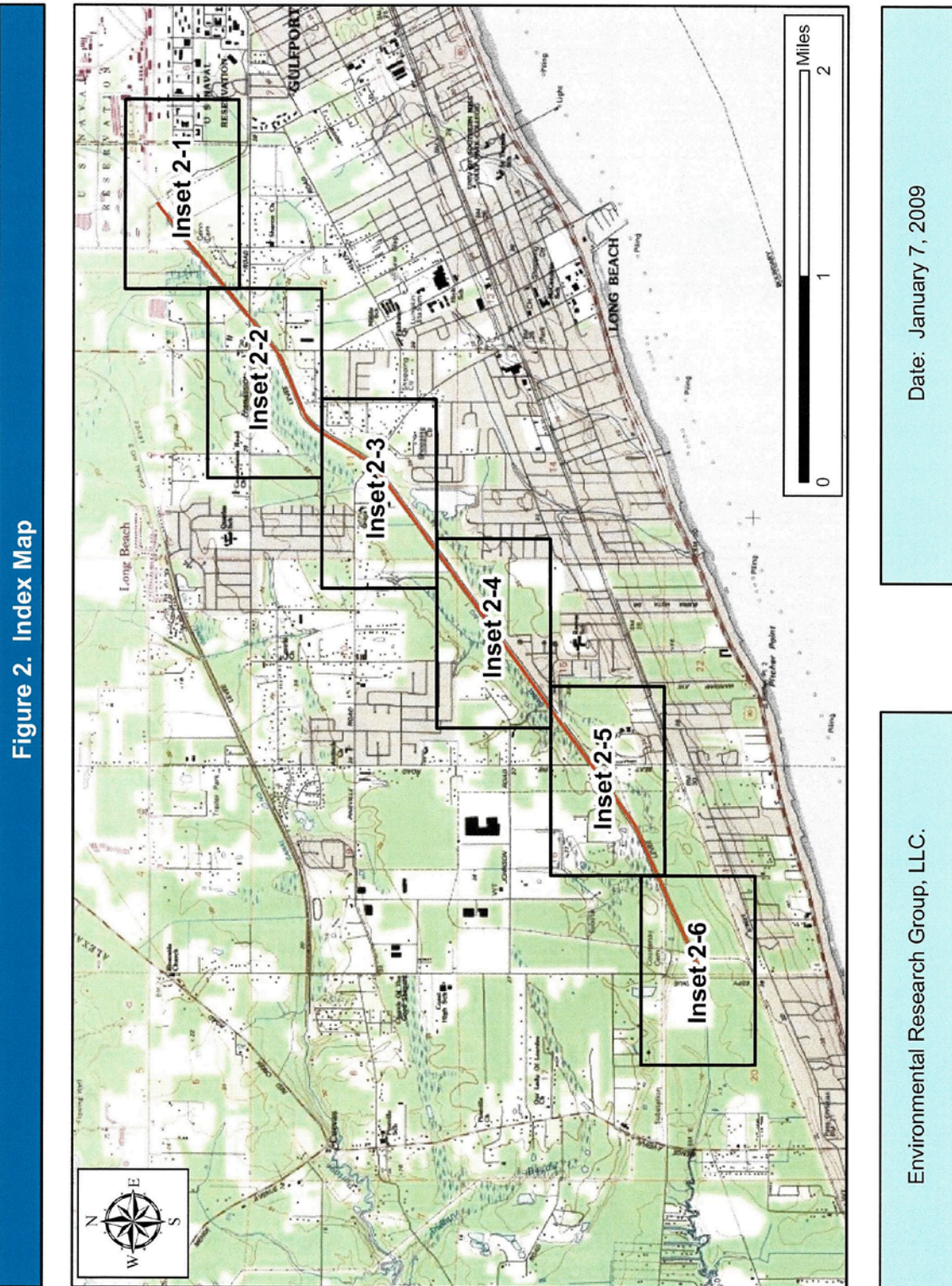
### 3.4 Jurisdictional Areas Affected

The proposed project would have direct impacts to jurisdictional wetlands and waters of the U.S. Based on our observations, potential jurisdictional areas that would be affected by the proposed project total 2.72 acres of wetlands, 2.89 acres of ponds, 4.56 miles of Canal No. 1, and 3,647 linear feet (0.7 miles) of ditches (Figure 2-1 thru 2-6). A summary of potential jurisdictional features identified within the study area are presented in Table 1.

**Table 1.**  
**Potential Jurisdictional Features Identified within the Study Area**

FEATURE	POTENTIAL IMPACTS		
	Waters	Wetlands	Open Water
Canal No. 1	4.56 miles (24,062 feet)		
Ditches	0.7 miles (3,647 feet)		
Ponds			2.89 acres
Wetlands		2.72 acres	
<b>Total</b>	<b>5.26 miles (27,709 feet)</b>	<b>2.72 acres</b>	<b>2.89 acres</b>





3-3



Figure 2-1. Potential Jurisdictional Features within the Study Area



3-4

Date: January 7, 2009

Environmental Research Group, LLC.



Figure 2-2. Potential Jurisdictional Features within the Study Area



3-5

Date: January 7, 2009

Environmental Research Group, LLC.



Figure 2-3. Potential Jurisdictional Features within the Study Area



3-6

Date: April 23, 2009

Environmental Research Group, LLC.



Figure 2-4. Potential Jurisdictional Features within the Study Area



3-7

Date: April 23, 2009

Environmental Research Group, LLC.



Figure 2-5. Potential Jurisdictional Features within the Study Area



3-8

Date: January 7, 2009

Environmental Research Group, LLC.





3-9